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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

June 17, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Patent Suits

Notices under 35 USC 290; Patent Act of 1952

3,017,304, Johnson & Johnson, ABSORBENT FIBROUS STRUCTURE AND METHOD OF PRODUCTION; **3,612,055,** same, DISPOSABLE DIAPER OR THE LIKE AND METHOD OF MANUFACTURE; **3,616,114,** same, REUSABLE COMPOSITE ADHESIVE SEALING TAPES; **3,938,522,** same, DISPOSABLE DIAPER, **filed** Sept. 21, 1977, D.C., E.D. Wis. (Milwaukee), Doc. 77–614, *Johnson & Johnson* v. *Kimberley-Clark Corporation.* Dismissed on Feb. 20, 1980.

3,122,474, Hoffmann-La Roche Inc., CHLORDIAZEPOXIDE AND CLIDINIUM HALIDE COMPOSITION AND METHOD OF USING SAME, **filed** Sept. 10, 1980, D.C.N.J. (Newark), Doc. 80–2952, *Hoffmann-La Roche Inc.* v. *Chelsea Laboratories.* **Same, filed** Sept. 10, 1980, D.C.N.J. (Newark), Doc. 80–2953, *Hoffmann-La Roche* v. *Zenith Laboratories.* **Same, filed** Sept. 10, 1980, D.C.N.J. (Newark), Doc. 80–2954, *Hoffmann-La Roche Inc.* v. *MD Pharmaceutical Inc.* **Same, filed** Sept. 10, 1980, D.C.N.J. (Newark), Doc. 80–2955, *Hoffmann-La Roche Inc.* v. *Pharmadyne Laboratories.*

3,233,451, Daniel G. Russ, METHOD AND APPARATUS FOR MEASURING THRUST IN JET-TYPE ENGINES, **filed** Aug. 5, 1980, U.S. Court of Claims (Wash., D.C.), Doc. 414–80 C, *Telectro-Mek, Inc. and Daniel G. Russ* v. *The United States.*

3,265,902, Itek Corporation, PHOTOELECTRIC SHAFT ANGLE ENCODER; **3,310,798,** same, ANALOG TO DIGITAL OPTICAL ENCODER; **3,312,828,** same, ANALOG TO DIGITAL ENCODING APPARATUS FOR DIRECTLY READING OUT INFORMATION, **filed** Aug. 4, 1980, U.S. Court of Claims (Wash. D.C.), Doc. 412–80 C, *Itek Corporation* v. *The United States.*

3,310,798. (See 3,265,902.)

3,312,828. (See 3,265,902.)

3,368,280, C & B Inc., DENTAL TOOL, **filed** June 29, 1979, D.C., W.D. Wash. (Seattle), Doc. C–79–821V, *Litton Industrial Products, Inc.* v. *Solid State Systems Corp.* Order granting defendant's motion for summary judgment filed Mar. 13, 1980. **Same, filed** July 13, 1979, D.C., N.D. Ind. (South Bend), Doc. 879–205, *Litton Industrial Products Inc.* v. *Mastersonics, Inc.* Plaintiff's complaint dismissed with prejudice and defendant's counterclaim granted. Sept. 15, 1980.

3,374,023, Roberts Consolidated Industries, Inc., KNEE-ACTUABLE CARPET STRETCHER WITH ADJUSTABLE-LENGTH SHANK, **filed** Sept. 4, 1980, D.C., N.D. Ga. (Atlanta), Doc. C80–1542A, *Roberts Consolidated Industries, Inc.* v. *Taylor Industries Co.*

3,491,500, Billy K. Watkins, POWER STOPPER WEIGHT TRANSFER APPARATUS, **filed** Aug. 24, 1979, D.C., W.D. Mo. (St. Joseph), Doc. 79–6053–CV–SJ, *Billy K. Watkins* v. *Dave Hager.* Defendants are enjoined and restrained from infringing plaintiff's patent. Filed Aug. 7, 1980. **Same, filed** Aug. 23, 1979, D.C., W.D. Tenn. (Jackson), Doc. 79–1113, *Billy K. Watkins* v. *Robin Wood et al.* Defendants are enjoined and restrained from infringing plaintiff's patent. Filed Aug. 8, 1980.

3,510,471, Leslie C. Case, NOVEL POLYETHER POLYOLS AND PROCESS FOR PREPARING THE SAME, **filed** Mar. 4, 1975, D.C. District of Columbia (Wash. D.C.), Doc. 75–0290, *Leslie C. Case* v. *The Commissioner of Patents, Hyman M. Molotsky et al.* Order granting motions of defendants 1, 2 and 3 to dismiss; denying motion of plaintiff for summary judgment and denying as moot motion of defendants 1, 2 and 3 to stay proceedings filed on Apr. 30, 1975. **Same, filed** Dec. 29, 1975, U.S. Ct. of Appeals (1st Cir., Boston), Doc. 75–1493, *Leslie C. Case* v. *The Commissioner of Patents and Trademarks et al.* The order of the district court is affirmed. Feb. 20, 1976.

3,612,055. (See 3,017,304.)

3,616,114. (See 3,017,304.)

3,631,294, Princeton Electronic Products, Inc., ELECTRONIC STORAGE UTILIZING A TARGET COMPRISING BOTH SILICON AND SILICON DIOXIDE AREAS, **filed** Oct. 3, 1978, D.C., S.D.N.Y., Doc. 78–C–4642, *Princeton Electronic Products, Inc.* v. *Bell Telephone Labs., Inc.*

3,650,149, Clayton Manufacturing Company, Inc., ENGINE IGNITION AND POWER ANALYZER, **filed** Jan. 3, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78–1, *Clayton Manufacturing Company, Inc.* v. *Applied Power, Inc.* Dismissed on Mar. 21, 1980.

3,662,314, Piher Sociedad Anonima, ADJUSTABLE ANNULAR POTENTIOMETER WITH TERMINAL ATTACHMENT MEANS, **filed** Aug. 7, 1978, D.C., N.D. Ind. (South Bend), Doc. S78–0174, *Piher Sociedad Anonima* v. *CTS Corporation.* Ordered that case is reversed and remanded to Bd. of Patent Interferences for consideration of evidence and determination of merits on matters specified in 102(g). Sept. 27, 1979.

3,662,314, Piher Sociedad Anonima, ADJUSTABLE ANNULAR POTENTIOMETER WITH TERMINAL ATTACHMENT MEANS; **3,670,285,** CTS Corporation, VARIABLE RESISTANCE CONTROL WITH END COLLECTOR, **filed** May 12, 1980, D.C., N.D. Ind. (South Bend), Doc. S80–126, *Piher Sociedad Anonima* v. *CTS Corporation.*

3,667,604, Williams Patent Crusher & Pulverizer Co., Inc., MATERIAL REDUCING HAMMER MILL, **filed** Dec. 28, 1976, D.C., E.D. Mo. (St. Louis), Doc. 76–1201C(A), *Gruendler Crusher & Pulverizer Co.* v. *Williams Patent Crusher & Pulverizer Co., Inc. et al.* Plaintiff is enjoined from infringing defendant's patent per final judgment entered Aug. 29, 1980.

3,670,285, CTS Corporation, VARIABLE RESISTANCE CONTROL WITH END COLLECTOR, **filed** Apr. 1, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c1152, *CTS Corporation* v. *Piher International Corporation.* Cause and case hereby dismissed with prejudice on Mar. 16, 1978.

3,670,285. (See 3,662,314.)

3,671,523, Kurt Westphal et al., HERBICIDAL AGENTS; **3,905,801,** Maged M. Fawzi, SUBSTITUTED 1,2,4-TRIAZINE-5-ONES AS HERBICIDES, **filed** Jan. 15, 1980, D.C. District of Columbia (Wash. D.C.), Doc. 80–0124, *Kurt Westphal et al.* v. *Commissioner of Patents and Trademarks.*

3,701,748, Rohm and Haas, UNSATURATED POLYESTER RESINOUS COMPOSITIONS; **3,772,241,** same, **filed** Aug. 15, 1977, D.C., N.D. Ohio (Toledo), Doc. C-77-419, *Rohm and Company* v. *Hatco Polyester Division et al.*

3,706,696, Tile Council of America, Inc., GROUTING COMPOSITION, **filed** Dec. 6, 1977, D.C.N.J. (Newark), Doc. 77-2509, *Tile Council of America, Inc.* v. *Red Devil, Inc.* Stipulation and order dismissing action without costs filed Sept. 28, 1979.

3,766,608, Dennison Mfg. Co., HARNESSING DEVICE, **filed** Nov. 23, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c4348, *Panduit Corp.* v. *Dennison Manufacturing Co.* Defendants motion to dismiss complaint as untimely filed is granted on Mar. 1, 1977. **Same, filed** Apr. 13, 1979, D.C., N.D. Ill. (Chicago), Doc. 76c4348, *Panduit Corp.* v. *Dennison Manufacturing Co.*

3,772,241. (See 3,701,748.)

3,773,840, Bernard M. Regan, DIFLUOROMETHYL 1-2,2,3, 3-TETRAFLUOROPROPYL ETHER; **3,773,841,** same, 1-CHLORO - 2,2,3,3 - TETRAFLUOROPROPYL DIFLUOROMETHYL ETHER, **filed** Apr. 28, 1980, D.C.N.J. (Trenton), Doc. 80-1209, *Airco, Inc* v. *Baxter Travenol Lab.*

3,773,841. (See 3,773,840.)

3,778,614, TMI Limited, METHOD AND APPARATUS FOR MEASURING X- OR Y-RADIATION ABSORPTION OR TRANSMISSION AT PLURAL ANGLES AND ANALYZING THE DATA; **3,866,047,** same, PENETRATING RADIATION EXAMINING APPARATUS HAVING A SCANNING COLLIMATOR; **3,924,129,** same, METHOD AND APPARATUS FOR CONSTRUCTING A REPRESENTATION OF A PLANAR'S SLICE OF BODY EXPOSED TO PENETRATING RADIATION; **3,924,131,** same, METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **3,946,234,** same, APPARATUS FOR EXAMINING BODIES BY MEANS OF PENETRATING RADIATION; **3,965,357,** same, APPARATUS FOR EXAMINING A BODY BY MEANS OF PENETRATING RADIATION; **filed** Aug. 8, 1977, D.C. Del. (Wilmington), Doc. C.A. 77-304, *EMI Limited* v. *Pfizer, Inc. et al.*

3,778,614, EMI Limited, METHOD AND APPARATUS FOR MEASURING X- OR Y-RADIATION ABSORPTION OR TRANSMISSION AT PLURAL ANGLES AND ANALYZING THE DATA; **3,924,129,** same, METHOD AND APPARATUS FOR CONSTRUCTING A REPRESENTATION OF A PLANAR'S SLICE OF BODY EXPOSED TO PENETRATING RADIATION; **3,924,131,** same, METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **3,944,833,** same, APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **4,035,647,** same, RADIOGRAPHY; **4,052,618,** same, APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **4,096,390,** same, APPARATUS FOR EXAMINING OBJECTS BY MEANS OF PENETRATING RADIATION; **4,114,042,** same, RADIOGRAPHY, **filed** Sept. 25, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-612, *EMI Limited* v. *General Electric Company.*

3,859,575, Shih-Ying Lee and Yao-Tzu Li, VARIABLE CAPACITANCE SENSOR, **filed** Mar. 20, 1978, D.C. Mass. (Boston), Doc. 78-0715-F, *Rosemount, Inc.* v. *Shih-Ying Lee et al.*

3,862,819, Fred A. Wentworth, Jr., FULL CATALYZER; **4,016,837,** same, VAPOR INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINES; **D. 235,448,** same, HUMIDIFIER HOUSING FOR ATTACHMENT TO A COMBUSTION SYSTEM, **filed** Sept. 8, 1977, D.C. Mass. (Boston), Doc. 77-2732-S, *Vaporpak, Inc.* v. *Aftco Corporation et al.*

3,866,047. (See 3,778,614.)

3,867,005, Bunker Ramo Corporation, INSULATION-PIERCING CONTACT MEMBER AND ELECTRICAL CONNECTOR, **filed** Oct. 23, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3563, *Bunker Ramo Corporation* v. *TRW Inc.* Order of dismissal with prejudice dated Aug. 26, 1980.

3,868,790, Roy A. Fricke, SPARK PLUG CLEANER; **4,028,851,** same, **4,062,155,** same, **filed** July 13, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-C-436, *Wells Mfg. Corp.* v. *Roy A. Fricke et al.* Transferred to N.D. Ill. (Chicago), on Feb. 22, 1979.

3,890,157, Construction Products Research, Inc., CEMENTITIOUS SYSTEMS INCORPORATING PARTICULATE ADSORBENTS, **filed** Mar. 13, 1978, D.C., E.D. Pa. (Philadelphia), Doc. 78-822, *Construction Products Research, Inc.* v. *Cempro, Inc.*

3,905,801. (See 3,671,523.)

3,924,129. (See 3,778,614.)

3,924,131. (See 3,778,614.)

3,930,769, Vereinigte Nahrungsmittelindustrie Aktiengesellschaft, PROCESS AND APPARATUS FOR PRODUCING A THIN DOUGH MATERIAL; **3,991,220.** same, PROCESS FOR PRODUCING A THIN DOUGH MATERIAL, **filed** Jan. 4, 1980, D.C. District of Columbia (Wash. D.C.), Doc. 80-0024, *Everex Corporation* v. *Vereinigte Nahrungsmittelindustrie Aktiengesellschaft.*

3,938,522. (See 3,017,304.)

3,942,338, Furlette and Stadler, TORQUE LIMITING COUPLING; **4,056,953,** same, **filed** Nov. 26, 1979, D.C., E.D. Mich. (Detroit), Doc. 79-74482, *Automa Corp. et al.* v. *Excel Corp. et al.*

3,944,833. (See 3,778,614.)

3,946,234. (See 3,778,614.)

3,965,357. (See 3,778,614.)

3,991,220. (See 3,930,769.)

4,000,000, Robert L. Mendenhall, PROCESS FOR RECYCLING ASPHALT-AGGREGATE COMPOSITIONS, **filed** Mar. 21, 1977, D.C. Ariz. (Phoenix), Doc. 77-217 PHX WEC, *Robert L. Mendenhall* v. *Donald C. Speer et al.*

4,016,837. (See 3,862,819.)

4,022,520, John U. White, FEATURE EXTRACTION SYSTEM FOR EXTRACTING A PREDETERMINED FEATURE FROM A SIGNAL, **filed** Feb. 20, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c0873, *John U. White* v. *The Perkin-Elmer Corporation.*

4,028,851. (See 3,868,790.)

4,035,647. (See 3,778,614.)

4,046,923, L. D. Schreiber Cheese Company, Inc., PACKAGE WITH STAGGERED PRODUCT SLICES AND PROCESS FOR PRODUCING THE SAME, **filed** July 28, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-476, *L. D. Schreiber Cheese Company, Inc.* v. *Interstate Food Corporation, Inc. et al.* Dismissed on Jan. 23, 1980.

4,047,355, Studco, Inc., SHAFTWALL, **filed** Oct. 22, 1979, D.C., N.D. Ohio (Cleveland), Doc. C79-1192Y, *Studco, Inc.* v. *National Gypsum Company, doing business as Gold Bond Building Products.*

4,052,618. (See 3,778,614.)

4,053,845, Gordon Gould, OPTICALLY PUMPED LASER AMPLIFIERS, **filed** Oct. 19, 1977, D.C., M.D. Fla. (Orlando), Doc. 77-438-Orl-Civ-Y, *Gordon Gould* v. *Control Laser Corporation.* **Same, filed** July 26, 1978, D.C., N.D. Calif. (San Francisco), Doc. C-78-1670, *Gould* v. *General Photonics Corp.*

4,056,953. (See 3,942,338.)

4,062,155. (See 3,868,790.)

4,096,390. (See 3,778,614.)

4,114,042. (See 3,778,614.)

4,143,760, Olaf A. Hallstrom, RECIPROCATING CONVEYOR, **filed** Oct. 12, 1979, D.C. Oreg. (Portland), Doc. 79-1230, *Olaf A. Hallstrom* v. *R. Keith Foster, doing business as Keith Mfg. Co.*

D. 235,448. (See 3,862,819.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,246,082, Re. S.N. 165,593, Filed Jul. 3, 1980, Cl. 179/1, TELEPHONE HOLD PROGRAM SYSTEM, Alfred Levy, Owner of Record: *Telephone-Hold Systems Corporation, Oyster Bay, N.Y.*, Attorney or Agent: Albert C. Holte, Jr., et al., Ex. Gp.: 234

3,749,975, Re. S.N. 157,286, Filed Jun. 6, 1980, Cl. 315/241 R, ADJUSTABLE WAVEFORM SPARK SOURCE, John P. Walters, Owner of Record: *Wisconsin Alumni Research Foundation, Madison, Wis.*, Attorney or Agent: Francois N. Palmatier, et al., Ex. Gp.: 256

4,101,011, Re. S.N. 178,274, Filed Aug. 15, 1980, Cl. 188/79.5, DRUM BRAKE ADJUSTER, Richard T. Burnett, Owner of Record: *The Bendix Corporation, Southfield, Mich.*, Attorney or Agent: Paul David Schoenle, Ex. Gp.: 315

4,206,106, Re. S.N. 181,514, Filed Aug. 25, 1980, Cl. 260/302, VINYL END-CAPPED POLYMIDE OLIGOMERS, William J. Heilman, Owner of Record: *Gulf Oil Corporation, Pittsburgh, Pa.*, Attorney or Agent: Deane E. Keith, et al., Ex. Gp.: 144

4,210,339, Re. S.N. 179,121, Filed Aug. 18, 1980, Cl. 277/153, SEAL AND SEAL ASSEMBLY, James H. Povejsil, Owner of Record: *Towmotor Corporation, Mentor, Ohio,* Attorney or Agent: Ralph E. Walters, Ex. Gp.: 241

PATENT NOTICES

Certificates of Correction for the Week of Nov. 18, 1980

D. 256,541	4,195,473	4,207,528	4,215,701
4,032,322	4,195,515	4,208,590	4,215,824
4,055,463	4,196,436	4,208,764	4,215,855
4,057,065	4,197,594	4,208,959	4,215,870
4,057,416	4,197,979	4,209,184	4,216,288
4,057,566	4,198,051	4,209,229	4,216,396
4,059,433	4,198,145	4,209,230	4,216,497
4,071,546	4,198,425	4,209,248	4,216,557
4,075,001	4,198,518	4,209,378	4,216,590
4,082,719	4,198,999	4,209,962	4,216,680
4,094,904	4,199,372	4,210,029	4,216,818
4,097,092	4,199,771	4,210,270	4,216,841
4,098,814	4,199,952	4,210,495	4,216,987
4,100,164	4,200,369	4,210,496	4,217,229
4,113,539	4,200,985	4,210,577	4,217,249
4,138,158	4,202,011	4,210,624	4,217,395
4,138,979	4,202,686	4,210,721	4,217,706
4,145,503	4,203,264	4,211,121	4,217,935
4,147,109	4,203,268	4,211,153	4,218,137
4,152,349	4,203,708	4,211,183	4,218,222
4,152,479	4,203,788	4,211,203	4,218,331
4,153,974	4,203,931	4,211,339	4,218,381
4,159,310	4,204,320	4,211,635	4,218,463
4,160,684	4,204,405	4,211,820	4,218,612
4,162,645	4,205,119	4,212,800	4,218,727
4,162,787	4,205,301	4,212,957	4,218,953
4,170,684	4,205,433	4,213,058	4,219,156
4,171,783	4,205,523	4,213,921	4,219,166
4,172,843	4,205,606	4,213,947	4,219,220
4,176,702	4,205,895	4,213,982	4,219,910
4,178,318	4,206,002	4,214,088	4,219,917
4,182,425	4,206,133	4,214,150	4,220,113
4,182,699	4,206,255	4,214,343	4,220,199
4,182,837	4,206,392	4,214,860	4,220,930
4,184,060	4,206,482	4,214,951	4,221,483
4,184,974	4,206,616	4,215,039	4,221,778
4,188,343	4,207,451	4,215,043	4,221,919
4,189,217	4,207,459	4,215,252	4,222,325
4,189,232	4,207,504	4,215,684	4,222,440
4,195,239	4,207,521	4,215,697	4,222,564
			4,223,156

Adverse Decisions in Interferences

In the designated interference involving the indicated claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,725,058, Y. Hayashi, M. Hasegawa, DUAL LAYERED PHOTORECEPTOR EMPLOYING SELENIUM SENSITIZER, Interference No. 98,832, decided May 29, 1980, Claim 1.

Patent No. 3,944,333, M. Leibowitz, ELECTROCHROMIC DISPLAY WITH POROUS SEPARATOR, Interference No. 99,756, decided July 1, 1980, Claims 1, 4 and 6.

Patent No. 4,010,261, E. S. Johnson, R. H. Rippel, Jr., METHOD TO PREVENT REPRODUCTION WITH [DES-GLY^{10}-GN-RH NONAPEPTIDE AMIDE ANALOGS IN POSITION 6, Interference No. 99,713, decided June 11, 1980, Claim 3.

Patent No. 4,041,090, J. D. McClure, ETHYLBENZENE PROCESS USING AN UNSUPPORTED PERFLUORINATED POLYMER CATALYST, Interference No. 100,323, decided Sept. 11, 1980, Claims 1–3.

Patent No. 4,049,934, R. L. Newlon, SECURITY HINGE HAVING ADJUSTABLE CAM OPERATOR AND RECIPROCABLE CAM FOLLOWER ACTUATED SWITCH, Interference No. 100,172, decided Aug. 5, 1980, Claims 5–8.

Patent No. 4,076,403, M. Nishikawa, E. Sato, ELECTROGRAPHIC PROCESS, Interference No. 100,113, decided July 18, 1980, Claims 1 and 3.

Patent No. 4,104,389, C. F. Schwender, B. R. Sunday, ANTIALLERGIC PYRIDO(2,1-b)QUINAZOLIN-ONES, Interference No. 100,294, decided Sept. 16, 1980, Claim 4.

Patent No. 4,144,453, P. Rigny, METHOD AND DEVICE FOR EXCITATION AND SELECTIVE DISSOCIATION BY ABSORPTION OF LASER LIGHT AND APPLICATION TO ISOTOPIC ENRICHMENT, Interference No. 100,422, decided Sept. 15, 1980, Claim 1.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

Disclaimer

4,204,811.—*William L. Carter,* Scottsdale, *Jack F. Greathouse* and *Philip T. Zelinger,* Tempe, Ariz. FLUID PUMPING SYSTEM. Patent dated May 27, 1980. Disclaimer filed Sept. 18, 1980, by the assignee, *The Garrett Corporation.*

Hereby enters this disclaimer to claims 1–10 all claims of said patent.

Disclaimer and Dedication

3,321,202.—*Merrill D. Martin,* Oakland, Calif. AUTOMATIC SHEET STACKERS. Patent dated May 23, 1967. Disclaimer and Dedication filed Mar. 16, 1977, by the inventor.

Hereby disclaims and dedicates all the claims of said patent.

Patents Available for Licensing or Sale

3,961,386. TOILET SEAT COVERS. Ferdianand Beno, Suite 204, 820 S. Park Terrace, Chicago, Ill. 60605.

4,211,657. MEANS FOR BIOLOGICAL TREATMENT OF WATER. V. Etlin, 7403 Lisle Ave., Falls Church, Va. 22043.

4,217,059. VALVE SYSTEM FOR CONTROL OF PAINT TO SPREADER. J. L. Shelton, 257, 43rd Ave. NE., St. Petersburg, Fla. 33703.

Pitney Bowes, Inc., announces that non-exclusive licenses under reasonable terms are available under the following U.S. Patents:

4,074,574. POSTAGE METER CONVERSION APPARATUS.

4,061,044. METER SETTING INDEXING GEAR APPARATUS.

4,082,006. POSTAGE METER CONVERSION APPARATUS.

4,083,262. POSTAGE METER CONVERSION APPARATUS.

4,221,135. POSTAGE METER CONVERSION APPARATUS.

Please address all inquiries to Corporate Patent Counsel, Patent Dept., Pitney Bowes, Inc., Walter H. Wheeler, Jr., Drive, Stamford, Conn. 06926.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation, Sr., Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

4,215,921. INTERMITTENT PRIME FILM MOVER USING MULTI-TOOTHED WHEEL DRIVE.

4,216,388. NARROW PULSE ELIMINATOR.

4,216,390. LEVEL SHIFT CIRCUIT.

4,216,393. DRIVE CIRCUIT FOR CONTROLLING CURRENT OUTPUT RISE AND FALL TIMES.

4,216,394. LEAKAGE CURRENT COMPENSATION CIRCUIT.

4,216,396. SAMPLE-HOLD PHASE DETECTOR.

4,216,407. FLAT PANEL DISPLAY DEVICE WITH BEAM COLLECTOR.

4,216,435. VOLTAGE-TO-CURRENT CONVERTER APPARATUS.

4,216,441. ASTABLE MULTIVIBRATOR CIRCUIT.

4,216,442. CONTROL CIRCUIT FOR MULTIVIBRATOR.

4,216,501. OPTICAL ANTI-REFLECTIVE INFORMATION RECORD.

4,216,502. PEAK DETECTOR CIRCUIT.

4,216,523. MODULAR PRINTED CIRCUIT BOARD.

4,216,969. CARRIAGE TRANSLATING APPARATUS FOR VIDEO DISC PLAYER.

4,216,970. VIDEO DISC LUBRICANTS.

4,217,014. METHOD FOR ASSEMBLING A BASE TO AN ELECTRON TUBE.

4,217,148. COMPENSATED AMORPHOUS SILICON SOLAR CELL.

4,217,393. METHOD OF INDUCING DIFFERENTIAL ETCH RATES IN GLOW DISCHARGE PRODUCED AMORPHOUS SILICON.

4,217,519. ISOLATION BUSBAR FOR A FLAT PANEL DISPLAY DEVICE.

4,217,605. COMB FILTER EMPLOYING A CHARGE TRANSFER DEVICE WITH PLURAL MUTUALLY PROPORTIONED SIGNAL CHARGE INPUTS.

4,217,613. MAGNETIC TRANSDUCER HEAD CORE.

4,217,683. METHOD FOR RESISTANCE WELDING OF AN ELECTRO-OPTIC DEVICE HOUSING.

4,217,688. FABRICATION OF AN INTEGRATED INJECTION LOGIC DEVICE INCORPORATING AN MOS/DIPOLAR CURRENT INJECTOR.

4,218,214. GUIDE WING FOR A FURNACE PADDLE.

4,218,638. PUSH-PULL AMPLIFIER.

4,218,657. HANGUP CORRECTOR USEFUL IN LOCKED LOOP TUNING SYSTEM.

4,218,667. CONVERGENCE ADJUSTMENT ARRANGEMENT USING MAGNETIC TABS WITH DIFFERENTIAL MOTION.

4,218,689. ABLATABLE MEDIUM FOR OPTICAL RECORDING.

4,218,698. TV GRAPHICS AND MIXING CONTROL.

4,218,699. BLACK LEVEL CONTROL SYSTEM FOR A COLOR TELEVISION CAMERA.

4,218,708. KEYED AGC CIRCUIT.

4,219,787. RELAXATION OSCILLATOR NOT RESTRICTED BY FET THRESHOLD.

4,219,814. SCANNING RADAR.

4,219,826. OPTICAL RECORDING MEDIUM.

4,219,848. OPTICAL RECORD PLAYBACK APPARATUS EMPLOYING LIGHT FREQUENCY AT WHICH ALTERNATE REGIONS OF RECORD TRACK EXHIBIT ANTI-REFLECTION CONDITION.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

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Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service.
U.S. Department of Commerce.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

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Patent application 6-132,644. Device for Generating Simulated Waveforms for an Electronic System Maintenance Trainer. Filed Mar. 21, 1980.

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Patent 4,203,458. Negative Gravity Swivel Device. Filed Sept. 5, 1978. Patented May 20, 1980. Not available NTIS.

Patent 4,204,210. Synthetic Array Radar Command Air Launched Missile System. Filed Sept. 15, 1972. Patented May 20, 1980. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administration Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

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U.S. DEPARTMENT OF ENERGY

Assistance General Counsel for Patents
Washington, D.C. 20545

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Patent 4,170,817. Method and Means of Packaging Nuclear Fuel Rods for Handling. Filed May 2, 1978. Patented Oct. 16, 1979. Not available NTIS.

Patent 4,175,258. High Level White Noise Generator. Filed July 28, 1978. Patented Nov. 20, 1979. Not available NTIS.

Patent 4,178,208. Self Locking Drive System for Rotating Plug of a Nuclear Reactor. Filed Feb. 23, 1978. Patented Dec. 11, 1979. Not available NTIS.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

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U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

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Patent 4,188,905. Mine Sweeping Means. Filed Apr. 13, 1943. Patented Feb. 19, 1980. Not available NTIS.

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Patent 4,193,029. Pulsed Helium Magnetometer. Filed Mar. 4, 1963. Patented Mar. 11, 1980. Not available NTIS.

Patent 4,193,129. Charging Circuit for Sonar Systems. Filed Jan. 2, 1976. Patented Mar. 11, 1980. Not available NTIS.

Patent 4,193,297. Infrared Fuze Test Simulator. Filed July 31, 1963. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,193,346. Electrolytic Pressure Mechanism. Filed Mar. 16, 1953. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,194,194. Piezoelectric Vibration Detector for Sensing a Nearby Intruder. Filed Jan. 30, 1978. Patented Mar. 18, 1980. Not available NTIS.

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Patent 4,196,433. Doppler Frequency Proximity Fuze. Filed Dec. 23, 1959. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,196,448. TV Bandwidth Reduction System Using a Hybrid Discrete Cosine DPCM. Filed May 15, 1978. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,197,529. Intrusion Detection Apparatus. Filed Feb. 17, 1978. Patented Apr. 8, 1980. Not available NTIS.

Patent 4,202,517. Fluidic Interface Means. Filed July 20, 1977. Patented May 13, 1980. Not available NTIS.

Patent 4,203,365. Jammer Apprehending Amplifier for Proximity Fuzes. Filed July 20, 1977. Patented May 20, 1980. Not available NTIS.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

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Patent application 6–145,272. Photoelectric Detection System. Filed Apr. 30, 1980.

Patent application 6–145,273. Biocentrifuge System Capable of Exchanging Specimen Cages While in Operational Mode. Filed Apr. 30, 1980.

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Patent 4,199,937. Heat Exchanger and Method of Making. Filed Nov. 30, 1977. Patented Apr. 29, 1980. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

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State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738–5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862–1777
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255–7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448–1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 6, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-25-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-7-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-27-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-11-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	4-16-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-13-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-30-78
DESIGNS, GROUP 290—Vacant. Industrial Arts; Household, Personal and Fine Arts.	10-10-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-4-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	4-24-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during September 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,102,270 to 3,105,236, inclusive
Plant Patents ..... Numbers 2,277 to 2,288, inclusive

REISSUES

NOVEMBER 18, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,436

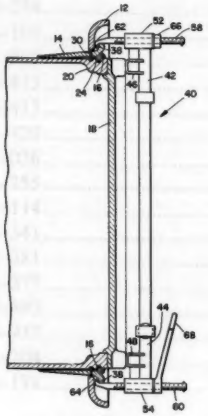
RIM CONSTRUCTION AND TOOL APPARATUS FOR SAFE TIRE INFLATION

Robert Casey, Tazewell County, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Original No. 3,995,676, dated Dec. 7, 1976, Ser. No. 626,422, Oct. 28, 1975. Application for reissue Jun. 9, 1978, Ser. No. 914,092

Int. Cl.[3] **B60C** *5/16*

U.S. Cl. 152—310 **3 Claims**



1. In a multi-piece wheel assembly comprised of a rim base member, a pair of flange members removably associated at either end thereof and formed to have an inflatable tire mounted therebetween, the rim base member defining first and second annular grooves circumferentially oriented adjacent one end, said first annular groove proximate said end, and a lock ring removably adapted to fit and positionable in said first annular groove and a seal member positioned in said second annular groove, the improvement comprising:

a bead [set] *seat* band formed to receive one flange member and mountable on said rim base member inwardly of said first annular groove and overlying said seal member, said lock ring [while] *being* seated in said first annular groove for retaining said bead seat band on said rim base member *said bead seat band being spaced from said rim base member defining a space therebetween in communication with the interior of the mounted tire;*

said bead seat band defining a plurality of radial ports *adjacent said one flange member* to communicate *the space and hence* the interior of [a] *the* mounted [inflated] tire with atmospheric air *between the flange member and the bead seat band when the radial ports are not sealed by the seal member,* said ports sealed by said seal member to block said communication between the interior of said mounted tire and atmospheric air only while said bead seat band is urged against said lock ring seated in said first annular groove.

Re. 30,437

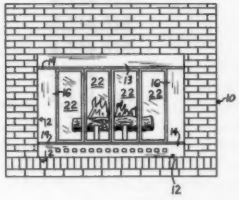
CORNER ASSEMBLY FOR FIREPLACE ENCLOSURE

Robert C. Dew, New Albany, Ind., assignor to S & T Industries, Inc., Louisville, Ky.

Original No. 3,995,612, dated Dec. 7, 1976, Ser. No. 585,474, Jun. 10, 1975. Application for reissue Dec. 4, 1978, Ser. No. 966,475

Int. Cl.[3] **F24C** *15/04*

U.S. Cl. 126—139 **8 Claims**



6. In a fireplace enclosure disposed to surround a fireplace outwardly of the opening therefor and having horizontal top and bottom panels and vertical side panels, the improvement comprising:

a. a plate-like corner bracket extending alongside end portions of adjacent horizontal and vertical panels,

b. means securing said plate-like corner bracket to said end portions of adjacent panels so that said end portions of adjacent panels are secured to each other, and

c. an adjustable retaining member carried by said plate-like corner bracket and having an adjustable projecting member disposed to engage an inner portion of the fireplace opening.

REISSUES

NOVEMBER 18, 1958

PATENTS

GRANTED NOV. 18, 1980

ERRATA

For CLASS	See PATENT NO.
337–374	4,233,750
474–153	4,233,852
474–185	4,233,853
493–132	4,233,888
440–101	4,233,925
248–404	4,234,165
024–068 CD	4,234,166
493–014	4,234,179
244–124	4,234,197
350–274	4,234,255
423–109	4,234,429
568–939	4,234,470
556–413	4,234,502
556–413	4,234,503
568–420	4,234,512
564–026	4,234,513
564–255	4,234,514
564–114	4,234,515
568–341	4,234,516
568–381	4,234,517
568–377	4,234,518
568–492	4,234,519
568–937	4,234,520
424–204	4,234,645
328–171	4,234,802

PATENTS

GRANTED NOV. 18, 1980

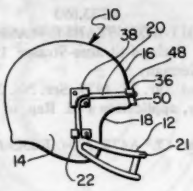
ERRATA

PATENTS

GRANTED NOVEMBER 18, 1980

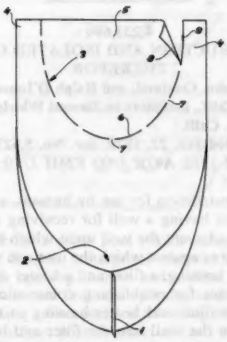
GENERAL AND MECHANICAL

4,233,687
SPORTS HELMET WITH FACE MASK
William E. Lancellotti, 371 Broadway, Providence, R.I. 02909
Filed Aug. 14, 1978, Ser. No. 933,783
Int. Cl.[3] A63B *71/10*; A42B *3/00*
U.S. Cl. 2—9 **1 Claim**



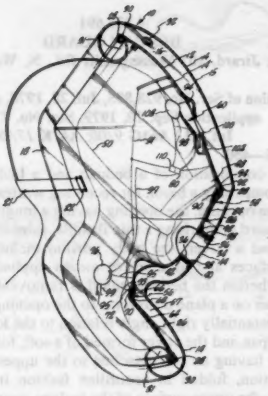
1. A safety device for use with a protective sports helmet in turn having downwardly extending opposed side portions and an upper central connecting portion forming a centrally disposed facial opening, comprising a mask adapted for disposition over said facial opening to protect the face of the wearer, said mask including a peripheral rod-like frame which has portions extending vertically along the outer surfaces of said side portions and then forwardly across the top front of said helmet whereby said frame extends generally around said facial opening, attachment means mounted on the outer surfaces of said side portions, said means comprising a pair of vertically spaced blocks on each side portion, said blocks each having grooves therein with reduced lead-in portions adapted to detachably snap-receive said frame, the bottom block on each side being adapted to receive said vertically extending portion adjacent the lower end thereof and the top block on each side having a curved groove configured to receive the corners where said vertical portions merge with said forward portion, said grooves all being at least partially exposed in a forward direction whereby said mask may be readily detached from said helmet in a forward direction by a pull thereon comprising a significant forward force component.

4,233,688
BIB
Jonna Hjerl, Freltoftevej 22, DK-5653 Near Lyndelse, Denmark
Filed Jan. 9, 1979, Ser. No. 2,057
Int. Cl.[3] A41B *13/10*
U.S. Cl. 2—49 R **1 Claim**



1. A bib formed from a substantially rectangular soft sheet material and having a pocket at one end and wherein at the other end of the sheet a single rupture line defines a narrow tie-strip at each side edge of the sheet and further defines a neck-line cutout, the sheet material inside said neckline cutout forming a napkin bounded by the end edge of the sheet and totally removable from the bib along said rupture line.

4,233,689
PROTECTIVE HEADGEAR
Stephen H. Baron, 3967 Eureka Dr., Studio City, Calif. 91604
Filed Mar. 27, 1978, Ser. No. 890,242
Int. Cl.[2] A42B *3/00*; A63B *69/02*
U.S. Cl. 2—413 **10 Claims**



1. Protective headgear for protecting the wearer's head and face, said headgear comprising a transparent inner shell adapted to fit over the wearer's face, an outer sheet of transparent material extending over said inner shell and about the perimeter portion thereof and being sealably secured to said inner shell along the perimeter portion thereof defining an air tight chamber about said inner shell, a portion of said chamber extending about and inwardly of the perimeter portion of said inner shell, valve means for inflating said chamber to render said chamber shock absorbing, and means for securing said inner shell and outer sheet on the wearer's head.

4,233,690
PROSTHETIC DEVICE COUPLINGS
Robert J. Akins, La Mesa, Calif., assignor to CarboMedics, Inc., San Diego, Calif.
Filed May 19, 1978, Ser. No. 907,664
Int. Cl.[3] A61F *1/22*
U.S. Cl. 3—1.5 **3 Claims**

1. A prosthetic heart valve for long term implantation in the human body including

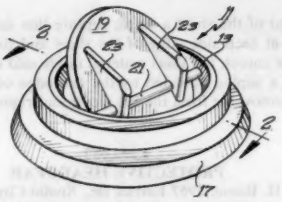
a generally tubular rigid portion,

a circumscribing sewing ring disposed in encircling relationship to said rigid tubular portion, and

a coupling element embedded within said sewing ring for joining said sewing ring to said heart valve tubular portion wherein the improvement comprises

said coupling element being made of a nickel-titanium alloy having a transition-temperature range, said element having been formed to a precise shape at a temperature above said range and having been deformed to a different shape at a temperature below said range whereby joinder of said

sewing ring to said rigid tubular portion is effected by raising the temperature of said element above said range in



order to cause said alloy to attempt to return to said precise shape.

4,233,691

BEDPAN GUARD

Lillian R. Jirard, 107 Wassagussitt Rd., N. Weymouth, Mass. 02191

Continuation of Ser. No. 928,895, Jul. 28, 1978, abandoned. This application Sep. 20, 1979, Ser. No. 77,172

Int. Cl.³ A61G *9/00;* A47K *17/00*

U.S. Cl. 4—450 **2 Claims**

1. The combination of a bedpan and a bedpan guard, the bedpan comprising a basin, for receiving wastes and a shoulder defining an opening, the opening having a longitudinal axis, the bedpan guard comprising a thin flexible, substantially flat body portion and a cover, the body portion including upper and lower surfaces and attachment means applied to the lower surface wherein the bedpan guard is removeably attached to said bedpan on a plane transverse to the opening of the bedpan and in substantially right angle relation to the longitudinal axis of the bedpan and the cover formed of a soft, foldable material, the cover having an end attached to the upper surface of the body portion, folded in accordian fashion into superposed relation to the upper surface of the bedpan guard, a free terminal end of said cover being adapted when extended to overlay the bedpan opening, and the free terminal end spaced from the end of the cover and having a fastening means engaged thereto, the fastening means engaging the bedpan when the cover is extended to overlay the bedpan opening.

4,233,692

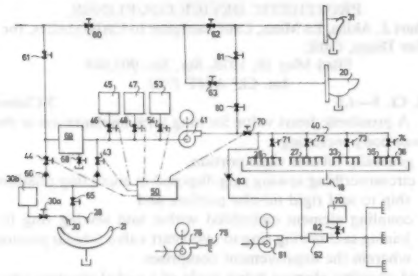
REST ROOMS

John D. Sinsley, 509 Sugar Camp Dr., East Palestine, Ohio 44413

Continuation of Ser. No. 917,192, Jun. 20, 1978, abandoned. This application Oct. 9, 1979, Ser. No. 82,736

Int. Cl.³ A47K *17/00*

U.S. Cl. 4—662 **6 Claims**



1. A readily sanitized public rest room module comprising a single formed unitary floor, ceiling, four walls and toilet fixtures, an entrance in one of said walls, a sealable closure for said entrance, a drain opening in said floor, lighting means sealingly recessed in one of said walls and ceiling, said toilet fixtures including a commode fixture positioned at the intersection between two of said walls and forming an integral unitary part thereof, and a lavatory and counter fixture on at least one wall adjacent said toilet and forming an integral unitary part of said wall, said wall and fixtures being a single integral unitary assembly free of joints with all intersecting surfaces being arcuately contoured and said floor being free of obstructions from wall to wall.

4,233,693

HEIGHT-ADJUSTABLE WASH-BASIN

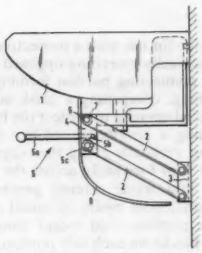
Peter Stocklöw, Richard-Strauss-Strasse 12, 1000 Berlin 33, Fed. Rep. of Germany

Filed Apr. 25, 1979, Ser. No. 33,058

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1978, 2819428

Int. Cl.³ A47K *1/04;* E03C *1/32*

U.S. Cl. 4—644 **14 Claims**



1. A height-adjustable washbasin including:

a washbasin having an upper portion and a downwardly extending portion;

a first supporting arm pivotally mounted to a stationary surface at one end and received by said downwardly extending portion of said washbasin at its other end;

a second supporting arm of equal length to said first supporting arm above and parallel to said first support arm mounted to said stationary surface at one end and received by said downwardly extending portion of said washbasin at its other end;

means enabling said washbasin to be arrested at different heights;

and a force reservoir counterbalancing the weight of said washbasin.

4,233,694

SPA CONSTRUCTION AND ISOLATED CONTROLS THEREFOR

Richard L. Janosko, Oakland, and Ralph D'Innocente, Pleasant Hill, both of Calif., assignors to Jacuzzi Whirlpool Bath, Inc., Walnut Creek, Calif.

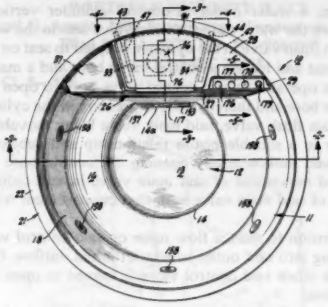
Filed Jan. 22, 1979, Ser. No. 5,627

Int. Cl.³ E04H *3/18;* A47K *3/00;* F24H *1/10;* H01H *9/00*

U.S. Cl. 4—542 **14 Claims**

1. In a spa construction for use by humans, a shell for containing water and having a well for receiving the feet of the user, a seat area adjacent the well upon which the user can sit and a side wall area against which the user can rest his back, a filter and heater housing, a filter and a heater disposed within the housing, means for establishing communication between the shell and the filter and heater housing so that water can flow from within the shell into the filter and heater housing, pump means for withdrawing water from the filter and heater housing and for introducing the same into the shell after the water has passed through the filter and control means carried

by the shell having controls which are accessible to a user while the user is within the shell for controlling the operation of the heater and the pump means, said heater and said pump means being electrically operated through said control means, said controls of said control means being electrically isolated from the remainder of the control means, and being free of any conductive path connecting the controls to the remainder of



the control means, said shell is formed of an insultating material and said electrically isolated switch means includes first and second actuatable switching elements with the first of said actuatable switchinw elements being positioned on the underside of the shell and wherein said controls include the second actuatable switching element located on the upper side of the shell generally opposite the first switching element for causing operation of said first switching element.

4,233,695

SWIMMING POOL COVER WITH RAIN WATER DRAINAGE AND FILTER MEANS

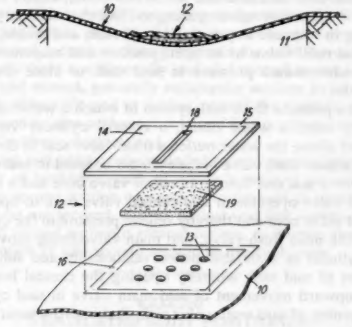
Michael H. Rowney, The Highwoods, Litlington, Polegate, East Sussex, England

Filed Aug. 2, 1979, Ser. No. 63,031

Claims priority, application United Kingdom, Aug. 4, 1978, 32342/78

Int. Cl.[3] **E04H** *3/16, 3/18*

U.S. Cl. 4—498 **6 Claims**



1. A cover for a water pool which comprises:

a sheet of flexible, waterproof material having at least one drainage opening therein and a filter pad assembly disposed over said drainage opening, said filter pad assembly comprising a filter pad and a holding means, said filter pad having a fine, porous structure and said holding means being made of a waterproof material secured in a watertight manner around at least a major portion of its periphery to that region of the cover surrounding the drainage opening thereby forming an envelope or a pocket with said sheet, said holding means containing an opening therein for the introduction of the filter pad thereinto, whereby said filter pad is held over the drainage opening for purifying water passing from the flexible sheet through the opening in the holding means, through the filter pad, and through the drainage opening into the water pool.

4,233,696

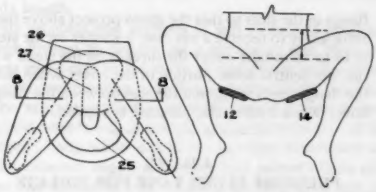
TOILET SEAT

Manfred Ibel, 178 Fifth Ave., New York, N.Y. 10010

Division of Ser. No. 922,492, Jul. 6, 1978. This application Nov. 9, 1979, Ser. No. 92,768

Int. Cl.[3] **A47K** *13/00*

U.S. Cl. 4—237 **4 Claims**



1. A toilet seat for positioning on a toilet bowl, said seat having an opening and an upper surface including enlarged inwardly extended opposite middle portions for the supportive engagement of the user's thighs, said enlarged middle portions being inwardly sloped and having opposite inner peripheral edge portions defining a relatively narrow middle portion of said opening, said opposite inner peripheral edge portions being on a substantially lower elevation than the outer peripheral upper surface areas of the seat and positioning the perineum of the user on said substantially lower elevation, said enlarged inwardly sloped middle portions also positioning the user's legs upwardly angled with the knees positioned above the elevation of the hip joints; said toilet seat having relatively narrow opposite front surface areas; said toilet seat having relatively narrow opposite rear surface areas defining an enlarged rear portion of said opening; the combined effect of said features positioning the user into a semi-squat position over the middle portion of a toilet bowl for easy defecation.

4,233,697

PROTECTIVE FLANGE COVER AND METHOD OF USE

Kenneth R. Cornwall, 30064 Bentley, Livonia, Mich. 48154

Filed Dec. 26, 1978, Ser. No. 972,956

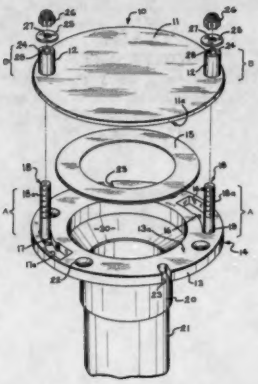
Int. Cl.[3] **A47K** *1/14*

U.S. Cl. 4—293 **6 Claims**

1. A cover with an inside and an outside surface adapted for closure of a toilet bowl mounting flange mounted on a drain pipe having a tubular flange opening leading to the drain pipe and having a flat toilet bowl receiving surface with two slots for inserting and holding bolt heads having threaded bolt stems which project from the flange for mounting the toilet bowl on the flange using nuts over washers on the stems and with an interposed ring seal between the receiving surface of the flange and the inside surface of the cover which comprises:

(a) a plastic plate having a thin central round dome portion inside the position of the ring seal which with the ring seal covers and seals the tubular flange opening and toilet bowl receiving surface; and

(b) two tubes with openings through the plate positioned on the plate to receive the stems of the bolts mounted on the



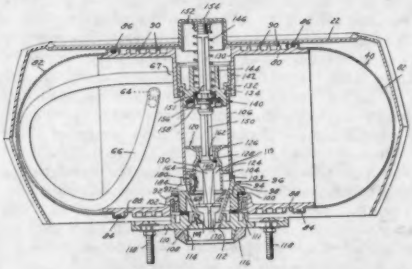
flange in the slots so that the stems project above the tubes sufficiently to receive a nut over a washer on the stem and so as to essentially cover the threads on the stem, wherein the thin central dome portion of the cover when bolted to the flange tends to tighten the seal between the flange and cover when hydrostatic pressure is applied.

4,233,698

PRESSURE FLUSH TANK FOR TOILETS

Raymond B. Martin, Birmingham, Mich., assignor to Water Control Products/N.A., Inc., Troy, Mich.

Filed Jan. 28, 1977, Ser. No. 763,502
Int. Cl.³ E03D *3/04*
U.S. Cl. 4—354 **9 Claims**



1. In a pressure flush tank system in which a water tank has a water inlet, a water outlet, a control cylinder vertically oriented above the water outlet, a main valve seat in the water outlet, a main flush valve in the cylinder adapted to seat on said main valve seat and having a central valve bore and a manual control valve operable in said central valve bore to open said control valve bore and thereby relieve pressure in the cylinder above the main flush valve, said main valve being movable in said cylinder in a slidable piston relationship and subject to pressure of said tank whereby opening the central bore will cause upward movement of said main valve in said cylinder and opening of said main valve seat, that improvement which comprises:

(a) an air inducer valve comprising an air vent opening in the water inlet of the water tank open to the top portion of the tank, an outwardly biased valve located in said water inlet movable to close said air vent opening and having a portion exposed to said water inlet, said valve being movable in response to reduced pressure induced by flow into said water tank through said water inlet and by negative pressure in said water inlet to admit air through said air vent opening to said tank.

2. In a pressure flush tank system in which a water tank has a water inlet, a water outlet, a control cylinder vertically oriented above the water outlet, a main valve seat in the water outlet, a main flush valve in the cylinder adapted to seat on said main valve seat and having a central valve bore and a manual control valve operable in said central valve bore to open said control valve bore and thereby relieve pressure in the cylinder above the main flush valve, said main valve being movable in said cylinder in a slidable piston relationship and subject to pressure of said tank whereby opening the central bore will cause upward movement of said main valve in said cylinder and opening of said main valve seat, that improvement which comprises:

(a) an extension to reduce flow noise on said control valve projecting into said outlet to restrict initial outflow from said tank when said control valve is moved to open said main valve.

4. In a pressure flush tank system in which a water tank has a water inlet, a water outlet, a control cylinder vertically oriented above the water outlet, a main valve seat in the water outlet, a main flush valve in the cylinder adapted to seat on said main valve seat and having a central valve bore, and a manual control valve operable in said central valve bore to open said control valve bore and thereby relieve pressure in the cylinder above the main flush valve, said main valve being movable in said cylinder in a slidable piston relationship and subject to pressure of said tank whereby opening the central bore will cause upward movement of said main valve in said cylinder and opening of said main valve seat, that improvement which comprises:

(a) means resiliently biasing said main flush valve to a partially open position wherein pressure in said cylinder will cause full closing of said main valve, and loss of water inlet pressure in said tank will effect opening of said main valve to allow water to drain from said tank through said main valve seat thus removing it from the water inlet to prevent backflow in the event of below atmospheric pressure in said water inlet, and

(b) a secondary valve opening communicating between the interior of said tank and said water outlet, a refill valve in said secondary valve opening to close the secondary opening in response to pressure in said tank, and means to bias said refill valve to an open position and responsive to a predetermined pressure in said tank to close the refill valve.

5. In a pressure flush tank system in which a water tank has a water inlet, a water outlet, a control cylinder vertically oriented above the water outlet, a main valve seat in the water outlet, a main flush valve in the cylinder adapted to seat on said main valve seat and having a central valve bore and a manual control valve operable in said central valve bore to open said control valve bore and thereby relieve pressure in the cylinder above the main flush valve, said main valve being movable in said cylinder in a slidable piston relationship and subject to pressure of said tank whereby opening the central bore will cause upward movement of said main valve in said cylinder and opening of said main valve seat, that improvement which comprises:

(a) a refill system including a resiliently biased, pressure responsive time-delay valve communicating between the interior of the tank and the outlet responsive to pressure in said tank to control the quantity of water entering the bowl after the siphonic flush action,

(b) a flow restrictor valve in said water inlet to control the flow rate of water into said tank, and

(c) said refill system comprising a secondary valve opening communicating between the interior of said tank and said

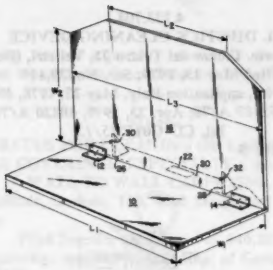
water outlet, said time delay valve being located in said secondary opening to close the opening in response to predetermined pressure in said tank, and means to bias said time delay valve to an open position and responsive to a predetermined pressure in said tank to close the time-delay valve.

4,233,699

PORTABLE SECURITY WALL

Michael G. Amato, 1306 Turner Ave., Wanamassa, N.J. 07712

Filed Dec. 4, 1978, Ser. No. 966,147
Int. Cl.[2] A47C *21/08*
U.S. Cl. 5—426 **5 Claims**



1. A portable security wall for infants, children, invalids, and the like, comprising:

a first, generally rectangular section for insertion beneath a chair cushion, a couch cushion, a mattress, etc., onto which the infant, child, or invalid is to be placed; and

a second, generally rectangular section rotatable with respect to said first section, to be substantially perpendicular therewith when intended for use in preventing such persons from falling from said chair, couch, mattress, etc. and to be substantially parallel therewith when put away and not intended for use with such persons;

wherein said second, generally rectangular section is positioned along a length of said first, generally rextangular section intermediate the ends thereof, and wherein there is also included first means affixed to each of said first and second sections to control the rotation of said sections with respect to each other to substantially ninety degrees;

wherein said included first means comprise a pair of right angled hinges, each of which is secured at one side of said first and second sections proximate the ends thereof;

wherein there is additionally included second means affixed to said second, generally rectangular section, to be rotatable therewith, and to further control the rotation of said second section with respect to said first section to substantially ninety degrees; and

wherein said additionally included second means comprise a pair of backstops, each of which is secured on a side of said second section opposite from the said to which said hinges are secured, to bear against said first section when said second section is rotated for use, to thereby limit the rotation of said second section to ninety degrees.

4,233,700

VENTILATED BODY POSITIONER

Donald C. Spann, 5 Ferncreek Ct., Greenville, S.C. 29615

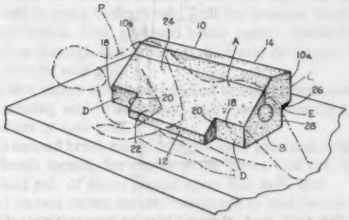
Filed May 31, 1979, Ser. No. 44,261
Int. Cl.[3] A47C *21/00, 27/14*
U.S. Cl. 5—431 **5 Claims**

1. A ventilated body positioner for providing lateral support for the body of a patient lying in a side position while providing ventilation and reduced pressure at strategic areas of support, said ventilated body positioner comprising:

an elongated positioner block of resilient deformable material having spaced longitudinal end portions and a plurality of planar surfaces on which said block may be rotated and selectively positioned as either a base or body supporting surface extending generally between said ends;

said planar surfaces being relatively inclined such that said elongated positioner block based on one of said planar surfaces presents another of said planar surfaces as a longitudinal body support surface having a widened sloping contour for properly positioning the patient in a side-rotated position;

said positioner block and hence each said planar surface having a length substantially greater than its lateral width



for supporting a substantial portion of the patient's lateral body length;

a cavity adjacent end portions of said elongated positioner block formed by cutting out a portion of said block in a plane transverse to the plane of said planar surfaces; and

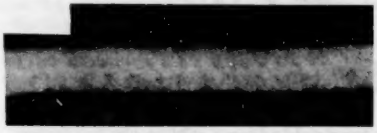
said cavity terminating to define a longitudinally extending edge support surface extending laterally from a main support surface which contact and support an area of said patient's body while said cavity provides ventilation to a non-contacted, supported area of said patient's body adjacent said contacted area reducing the buildup of heat and moisture and pressure at said areas to prevent the formation of decubitus ulcers.

4,233,701

NAPPED BEDDING BLANKET

Ralph G. Barnard, and Judson D. Taylor, Jr., both of Eden, N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Filed Nov. 8, 1976, Ser. No. 739,598
Int. Cl.[3] A47G *9/00*
U.S. Cl. 5—482 **8 Claims**



1. A napped bedding blanket having an enhanced hand and a more uniform surface appearance substantially devoid of clusters of undesirably long raised fibers, said blanket being characterized by substantially maintaining its initial surface appearance during normal usage and after laundering and by a resistance to shedding and pilling without reliance upon any stabilizing chemical treatment, said blanket comprising a fibrous substrate, a nap on at least one side of said substrate formed of raised substrate fibers shielding the substrate from view, the raised fibers of said nap being relatively uniformly distributed throughout the nap and extending generally outwardly away from the substrate, and with substantially all of the raised fibers being sheared and extending a uniform distance from the substrate to provide a substantially planar sur-

face on the nap substantially devoid of clusters of undesirably long raised fibers along the surface of the nap.

4,233,702

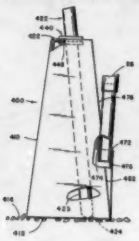
FISH TANK ROCK CLEANER

Michael R. Zweifel, 2434 4th Ave., Council Bluffs, Iowa 51501

Continuation of Ser. No. 5,438, Jan. 22, 1979. This application Aug. 16, 1979, Ser. No. 67,047

Int. Cl.³ E04H *3/20*

U.S. Cl. 15—1.7 **1 Claim**



1. A fish tank rock cleaning device comprising a housing with an open bottom to be rested on rock in the bottom of said aquarium, a stirring rod extended through said housing and moveable with respect to said housing for the stirring of said rock with an inner part of said rod by manipulating the outer part of said rod, a hose being attached to said housing at a point substantially spaced above said open bottom whereby said hose can be connected to a pump.

4,233,703

CLEANING DEVICE

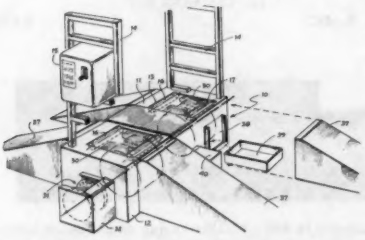
John C. Clyne, 6 Leo Ave., Lurnea, New South Wales, Australia (2170); William G. Steel, 27 Bertram Ave., Yagoona, New South Wales, Australia (2199), and Ronald T. Nicholls, 102 Wonga Rd., Lurnea, New South Wales, Australia (2170)

Filed Apr. 16, 1979, Ser. No. 30,590

Claims priority, application Australia, Nov. 3, 1978, PD6629

Int. Cl.³ B60S *3/06*

U.S. Cl. 15—53 B **10 Claims**



1. A cleaning device for use in cleaning the wheels of a vehicle which has wheels which are rotatable about a common axis, the device comprising:

an enclosure which is provided with two openings in an upper horizontal surface thereof, the openings defining cleaning zones, two pairs of spaced-apart substantially parallel rollers located within the enclosure, the rollers being disposed within the cleaning zones to support respective wheels of the vehicle, means for driving at least one roller of each pair whereby rotation of vehicle wheels is induced when the vehicle is supported by the rollers, a wiper element in the form of a rotatable brush located between the rollers of each pair and having an axis of rotation disposed parallel to the axes of rotation of the rollers, the wiper element being disposed within the cleaning zones and being arranged to contact and wipe the vehicle wheels when mounted to the rollers, means for imparting rotational drive to the wiper element, and at least one fixed brush located within each of the cleaning zones, the fixed brushes being located immediately below the respective openings in the enclosure and having bristles extending parallel to the axis of rotation of the wiper element.

4,233,704

OIL DIPSTICK CLEANING DEVICE

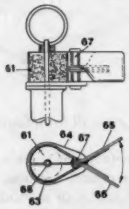
Lucio A. Sartorio, Piazza del Teatro 21, Velletri, (Rome), Italy

Filed May 15, 1979, Ser. No. 39,114

Claims priority, application Italy, May 23, 1978, 49495 A/78; Dec. 4, 1978, 52187 A/78; Apr. 23, 1979, 48820 A/79

Int. Cl.³ G01F *15/12*

U.S. Cl. 15—210 B **13 Claims**



1. An oil dipstick cleaning device, comprising a support having a pair of pivotally interconnected, semi-circular hollow jaws in contact with one another in a closed position, lever arms on said jaws having terminal ends spaced apart in said closed position of said jaws, means for biasing said jaws into said closed position, and cleaning pads disposed within said hollow jaws in confronting relationship in said closed position, said jaws including said pads being movable into an open position away from one another upon movement of said terminal ends of said arms toward one another against the action of said biasing means, whereby an oil dipstick to be cleaned may be inserted between said jaws in said open position, said jaws being then moved into said closed position, and the dipstick being wiped clean by said pads upon extraction thereof.

4,233,705

PAINT METERING TRAY FOR ROLLER APPLICATIONS

Michel Lepage, and Jeanne L. Lepage, both of General Delivery, Capreol, Ontario, Canada (POM 1HO)

Filed Jun. 27, 1979, Ser. No. 52,554

Int. Cl.³ B44D *3/12*

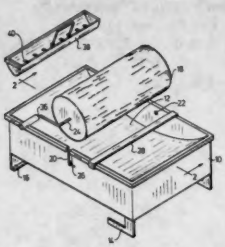
U.S. Cl. 15—257.06 **5 Claims**

1. A paint metering tray for use with a paint roller applicator comprising:

(a) a paint distribution roller positioned to be in contact along a lenthwise portion of the surface thereof with paint in said tray, said distribution roller being axially rotatable so as to permit coverage of the surface of the distribution roller with the paint when rotated, and

(b) a paint metering bar in lengthwise orientation along the surface of the distribution roller so as to control the

amount of paint on the distribution roller as the distribution roller is rotated against the said bar wherein the paint



metering bar is adjustably moveable into lengthwise contact along the surface of the distribution roller.

4,233,706

APPARATUS FOR CLEANING OF LARGE SCALE TEXTILE COVERINGS, ESPECIALLY CARPETS AND WALL TO WALL CARPETING

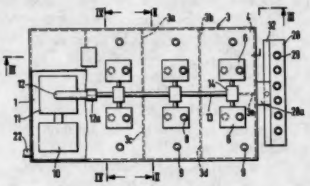
Horst Kauffeldt, Bachstr. 150, 4000 Düsseldorf, Fed. Rep. of Germany

Filed Sep. 27, 1978, Ser. No. 946,287

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1977, 2743530

Int. Cl.³ A47L *7/00*

U.S. Cl. 15—300 A **12 Claims**



1. An apparatus for cleaning textile covering materials comprising a dirt laden fluid receptacle, said dirt laden fluid receptacle comprising a plurality of vertically disposed partitions depending from the top of said receptacle, but being in out of contact relationship with the bottom of said receptacle whereby there is defined a plurality of vacuum chambers disposed over a common sump, each of said vacuum chambers being in fluid communication with a common suction nozzle via a dirty water pipe disposed therebetween, said vacuum chambers being connected via a suction conduit to at least one suction turbine connected to and activated by a motor, said apparatus having at least one spray jet connected to a supply of cleaning fluid.

4,233,707

FOOTWEAR CLEANING APPARATUS

Gilles Leblanc, 2152 Montee des 4 Lacs, St. Adolphe D'Howard, Montreal P. Q. JOT 2B0, Canada

Filed Jul. 9, 1979, Ser. No. 55,527

Int. Cl.³ A47L *5/22*

U.S. Cl. 15—311 **6 Claims**

2. A footwear cleaning apparatus for cleaning and collecting debris from a pair of articles of footwear such as shoes by a combination of brushing and recirculating compressed air, comprising:

(a) an open housing;

(b) a grill disposed within said housing and of a size to accommodate a pair of shoes, said grill including a plurality of slots disposed normal to an axis parallel with the sides of said shoes, and having a collection area defined by the central portion of said grill;

(c) spring means for supporting said grill on said housing, said spring means allowing downward movement of said grill when a person steps upon said grill;

(d) switch means, mounted to said grill and to said housing, for initiating the cleaning of said shoes upon said downward movement of said grill;

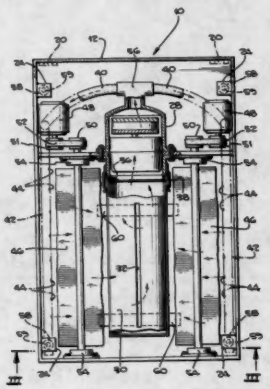
(e) power brush means for brushing debris from the lower sides of said shoes in a manner directing said debris toward said collection area, said brush means comprising:

(i) first brush means, substantially cylindrical in shape and of a length slightly larger than a shoe to be cleaned, for cleaning the bottom of one of said pair of shoes, said brush means being journaled in horizontal disposition in said housing beneath said grill for rotation toward said collection area, and said brush means contacting said shoe through said grill slots upon said downward movement of said grill,

(ii) first motor means, connected to said switch means, for rotating said brush means upon said downward movement of said grill,

(iii) second brush means, substantially identical to said first brush means, for cleaning the bottom of the other of said pair of shoes placed upon said grill, and

(iv) second motor means, connected to said switch means, for rotating said second brush means;



(f) air compressor means for blowing the debris from the upper sides of said shoes by compressed air in a manner directing said debris toward said collection area, and for collecting all aforesaid debris by recirculating said compressed air through said collection area, said air compressor means comprising:

(i) an air compressor connected to said switch means and supplying compressed air,

(ii) a pair of air hoses, connected between said air compressor and said grill for directing compressed air to said grill,

(iii) a pair of air tube means, connected to said air hoses and disposed along the outer edges of said grill, for directing a plurality of streams of compressed air across said upper sides of said shoes toward said collection area, said streams dislodging said debris on said upper sides of said shoes and directing said debris toward said collection area, and

(iv) air intake means, disposed beneath said collection area and connected to said compressor, for allowing said streams of compressed air to be drawn through said grill into said air compressor, said recirculated air carrying all aforesaid debris toward said compressor from said collection area;

(g) means for filtering said collected debris from said recir-

culated compressed air for storing said collected debris, said filtering and storing means comprising:

(i) a generally cylindrical tank removably disposed beneath said grill, said tank including a slot disposed directly beneath said collection area, said tank being open at one end and connected to said air compressor at said open end, and

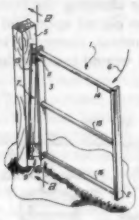
(ii) a filter element disposed across said open end of said tank, whereby debris in said collection area is drawn into said tank through said slot as said compressor recirculates said compressed air in said collection area through said tank, said filter element preventing said debris from entering said compressor and collecting said debris in said tank.

4,233,708

SELF-CLOSING HINGE APPARATUS

Thomas G. Bonar, P.O. Box 102, Aguila, Ariz. 85320

Filed Oct. 25, 1978, Ser. No. 954,342
Int. Cl.³ E05F 1/06
U.S. Cl. 16—152 **7 Claims**



1. A self-closing hinging apparatus for attaching a gate to a vertical upright, said gate having a first vertical edge and an opposite second vertical edge, said hinging apparatus comprising in combination:

a. an upper hinge including a first hinge joint and first and second leaves attached to said first hinge joint, said first leaf having a first attachment end for attachment to an upper portion of said vertical upright and said second leaf having a second attachment end for attachment to an upper portion of said gate;

b. a lower hinge including a second hinge joint and third and fourth leaves attached to said second hinge joint, said third leaf having a third attachment end for attachment to a lower portion of said vertical upright, said fourth leaf having a fourth attachment end for attachment to a lower portion of said gate, the distance between said first hinge joint and said second attachment end being approximately equal to a first distance, the distance between said second hinge joint and said fourth attachment end being approximately equal to a second distance, said second distance being substantially greater than said first distance; and

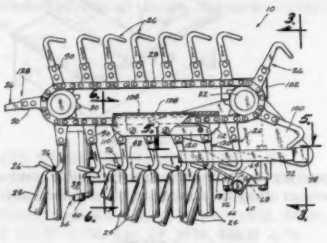
c. a reinforcing member rigidly attached to said upper hinge and said lower hinge adjacent said first hinge joint and second hinge joint, respectively, for maintaining said first hinge joint in alignment with said second hinge joint, said first and second hinge joints having first and second axes, respectively, said first and second axes lying along a common straight line, said common straight line being inclined with respect to said vertical upright, said common straight line also being inclined with respect to a plane parallel to said gate, said first hinge joint resisting any removal of either of said first leaf and said second leaf in a lateral direction from said first hinge joint, said second hinge joint resisting any removal of either of said third leaf and said fourth leaf in a lateral direction from said second hinge joint.

4,233,709

LINK CUTTER

David W. Smith, West Des Moines, and Mark W. Paar, Des Moines, both of Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa

Filed Jun. 6, 1979, Ser. No. 46,119
Int. Cl.³ A22C 11/00
U.S. Cl. 17—1 F **12 Claims**



1. An apparatus for separating stuffed product casing links interconnected by twisted casing sections, comprising, a support means, a conveyor on said support means, said conveyor including a plurality of hooks extended therefrom

at spaced-apart positions thereon, a cutting member on said support means, said conveyor being operative to advance each hook from a loading

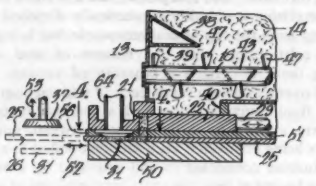
position, wherein said hook is adapted to receive and support a twisted casing section between a pair of links, to a cutting position wherein a twisted casing section supported thereon is moved into cutting engagement with said cutting member so as to be severed thereby.

4,233,710

MOLDING APPARATUS

Richard C. Wagner, Frankfort, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Filed Sep. 20, 1978, Ser. No. 944,000
Int. Cl.² A22C 7/00
U.S. Cl. 17—32 **9 Claims**



1. Apparatus for shaping a flat article from moldable food material of the nature of ground meat, comprising: a movable mold plate plate having a mold opening through the plate for receiving a pressurized charge of said material for said shaping of said article; spaced plates between which said mold plate is movable between mold opening filling position and article discharge position, said plates comprising means for confining the opposite sides of said mold opening at said mold filling position and thereby means for forming enclosing parts of said mold opening for said shaping, one of said plates comprising a vent plate; an entrance means to said mold opening at said mold filling position; means for directing said pressurized charge through said entrance means at said filling position and into said mold opening for said shaping of said articles; and a plurality of elongated slots in said vent plate extending longitudinally essentially parallel to said mold plate and spaced from

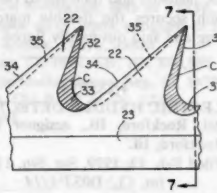
said mold opening entrance means when said mold plate is in said filling position for venting from said mold opening air displaced by said pressurized charge entering said mold opening wherein each said slot comprises a narrow air entrance side adjacent to said mold opening joinded to a wider air exhaust side spaced from said mold opening wherein each said slot comprises a narrow air entrance side adjacent to said mold opening joined to a wider air exhaust side spaced from said mold opening has been added.

4,233,711

METALLIC CARD CLOTHING

John D. Hollingsworth, P.O. Box 516, Greenville, S.C. 29602

Filed Sep. 6, 1978, Ser. No. 940,004
Int. Cl.³ D01G *15/88*
U.S. Cl. 19—114 **4 Claims**



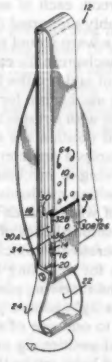
1. Metallic wire card clothing comprising:
an elongated metallic wire strip having a base portion;
a tooth forming portion integral with and extending upwardly from the base;
a plurality of spaced teeth punched in said tooth forming portion;
said teeth having a front face, sides defined by said tooth forming portion and a trailing edge;
said front face being punched forming an acute angle across the strip presenting a sharpened leading edge pointing in the direction of movement of the clothing; and
said sharpened leading edge extending substantially along the length of said front face.

4,233,712

STIRRUP BUCKLE

Thomas A. Horst, 2801 N. 111th St., Lafayette, Colo. 80026, and Charles L. Welton; a part interest Golden, Colo. assignors to Thomas A Horst, Lafayette, Colo., by said Charles L. Welton

Filed Jan. 2, 1979, Ser. No. 198
Int. Cl.³ A44B *11/02*
U.S. Cl. 24—166 **5 Claims**



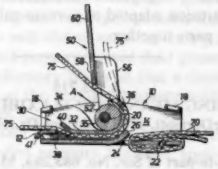
1. A buckle for use in detachably connecting the apertured ends of a strap together in overlapped relation which comprises:
at least one pin having a shank terminating at one end in an oversize head;
a slide having front and rear walls connected together in fixed spaced relation by end walls cooperating therewith to define a sleeve having a passage therethrough sized to receive the overlapped strap ends;
a generally channel-shaped keeper having a web bordered on both sides by inturned flanges, said keeper being sized and shaped to telescope inside the slide with its web in face-to-face relation with one of the walls of the slide and its flanges in sliding engagement with the end walls thereof, said keeper web having an opening therein sized to pass the shank of the pin and hold same in position to enter registering openings in the overlapped strap ends so as to prevent relative lengthwise movement therebetween, and said web and said one slide wall cooperating with one another and with said pin to retain the head of the latter therebetween; and,
means operatively interconnecting the keeper and slide effective to limit the relative telescopic movement therebetween between a closed position wherein said slide covers the shank of the pin thereby preventing removal of either of the overlapped strap ends therefrom and an open position uncovering the latter, and said means also being effective in all relative positions of said slide and keeper to prevent removal of said pin from its retained position therebetween.

4,233,713

LOCKABLE BUCKLE FOR BELTS, STRAPS AND THE LIKE

Odd Berg, Myntvägen 9, S-890 23 Själevad, Sweden

Filed May 15, 1978, Ser. No. 905,826
Claims priority, application Sweden, May 2, 1978, 7805073
Int. Cl.³ A44B *11/12*
U.S. Cl. 24—191 **16 Claims**

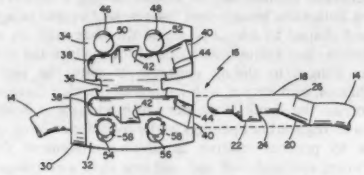


1. A lockable buckle for belts, straps and the like comprising an exterior shoe and a locking means accommodated therein and movable between a locked position and an open position for permitting a belt or the like to pass freely through the shoe in the opened position of the locking means and alternately for becoming locked and fixed in the shoe under friction at an optional place along the belt when the locking means is moved into the locked position, said locking means comprising (a) a movable slide in the shoe, the slide forming with the inside of the shoe a locking area through which the belt passes for nipping in the locked position between the slide and the shoe, and (b) a cam means pivotally mounted in the shoe and actuated by an operating arm, said cam means being engageable with the slide adjacent the exit end of said slide, for pressing the slide against the belt on assuming the locked position, and for lifting the slide from the belt when assuming the open position, said buckle being further comprised in that the slide is freely accommodated in the shoe, said slide including at its said exit end a portion partially surrounding the cam means for said lifting of said slide from said belt, said slide including adjacent its opposite entry end a transverse opening adapted to the cross section of said belt to form an entry opening to the said locking area for the belt.

4,233,714
END CLOSURE

Richard L. Panicci, Hanover, Mass., assignor to Kiddie Products, Inc., Avon, Mass.

Filed Dec. 8, 1977, Ser. No. 858,537
Int. Cl.[2] A44B *17/00*; F16G *15/00*
U.S. Cl. 24—201 R **6 Claims**



1. End Closure means comprising:

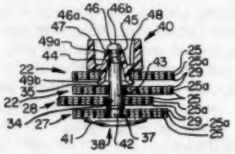
a latch member axially extending to an end and having a latch surface extending generally radially relative to the axis of said member at an acute angle facing away from said end; and

a body member adapted to encapsulate said latch member, said body member having two parts defining an axially extending latch member receiving recess therebetween, said recess having a shoulder extending generally radially at said acute angle for engaging said latch surface and said recess extending to and defining an opening at one end of said body member opposite the portion of said recess adapted for receiving said latch member and; a hinge extending on one side of the body member extending generally parallel to the axis of said recess and connecting said two body member parts together and spaced from said recess, on the side thereof away from said hinge, said body member parts respectively having at least one recess and protrusion having mutually engageable shoulders, said mutually engageable shoulders in said recess and on said protrusion adapted to permanently secure said body member parts together.

4,233,715
FASTENING MEANS FOR FLEXIBLE MATERIAL

Clifton E. McDermott, 1778 Oakridge Dr., Salt Lake City, Utah 84106

Continuation-in-part of Ser. No. 683,263, May 5, 1976, which is a division of Ser. No. 549,426, Feb. 12, 1975, Pat. No. 3,965,589.
This application Jun. 29, 1978, Ser. No. 920,485
Int. Cl.[2] A44B *17/00*
U.S. Cl. 24—217 R **6 Claims**



1. Fastening means for flexible material comprising

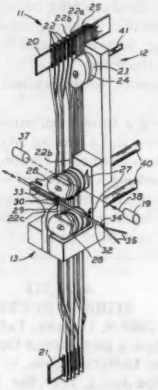
a male portion consisting of a generally flat base having a circular shank projecting perpendicularly therefrom, after passing through an opening in the flexible material said shank having a first portion of a given diameter extending from the flexible material followed by a tapered shoulder to a second portion having a smaller diameter and terminating at a head which has a first surface that extends abruptly outwardly at a 90° angle from the smaller shank portion and a second surface which is curved from a central top to the outer periphery of the surface and;

an integral on piece female portion adapted to interlock with the male portion comprising a circular outer ring having equidistantly spaced bars which project radially inwardly therefrom terminating in upward extensions thereof and in a continuous downwardly extending annular ring, said upward extensions being inclined inwardly and curved on the inside surface so that the space enclosed by the end of the upward extensions is a circle of approximately the same diameter as the smaller portion of the shank thus enabling the upper extensions to expand over the shank head and snap permanently into place around the shank; said continuous downwardly extending annular ring being in substantially the same inclined plane as the upward extensions and adapted to pass through an opening in the flexible material to be fastened and then flared outwardly to form a lip which secures the flexible material between the outer ring and said outwardly flared lip.

4,233,716
PHOTOELECTRIC HEDDLE DETECTION DEVICE

Dhiru B. Patel, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Feb. 12, 1979, Ser. No. 11,299
Int. Cl.[3] D03J *1/14*
U.S. Cl. 28—187 **10 Claims**



1. In a warp drawing machine having at least one heddle frame mounted thereon, each of said heddle frames having a pack of heddles slidably supported thereon, each of the heddles in said pack having a warp strand receiving eye therethrough, a heddle selecting mechanism for each of said heddle frames to separate an end one of said heddles from the pack on the frame, a heddle positioning mechanism for each of said heddle frames adapted to cooperate with a respective heddle selecting mechanism to engage and position the separated heddle such that the eye thereof occupies a predetermined warp strand receiving position, a drawing-in mechanism adapted to cooperate with said heddle position mechanisms for drawing successive ones of a plurality of warp strands through the eye of respective successively positioned ones of said heddles, and a heddle detecting device operatively associated with the heddle positioning mechanisms for detecting the absence of any heddle being in a warp strand receiving position, said heddle detecting device comprising a light source producing a beam of light, said source located to one side of said heddle frames and said heddle selecting and positioning mechanisms in a position to project said beam of light across the machine in a path interrupted by any of said positioned heddles, a light beam receiver located to the opposite side of said heddle frames and said

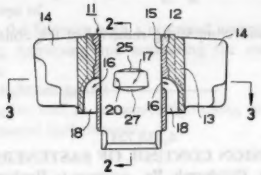
heddle selecting and positioning mechanisms in a position to receive the beam of light when no heddle is in a warp strand receiving position, and a photoelectric device producing a signal in resonse to reception of the beam of light by said light beam receiver.

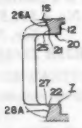
4,233,717

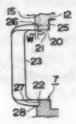
METHOD OF BEVELLING PORT OPENINGS IN CYLINDERS FOR TWO-CYCLE ENGINES

Kenichi Noda; Hiroshi Murakami, both of Tokyo, and Noboru Kurata, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 940,985
Claims priority, application Japan, Sep. 12, 1977, 52-109700
Int. Cl.³ B23P *13/00, 15/00*
U.S. Cl. 29—156.4 WL **10 Claims**







1. A method of bevelling a port opening in a cylinder of an engine, said port opening having a pair of spaced side edges extending parallel with the cylinder axis and upper and lower edges extending therebetween, comprising the steps of:

shaping at least the upper and lower edges, transverse to a piston stroke, of a port opening, on an inner wall of a cylinder;

said shaping being done integrally with said cylinder when casting said cylinder;

said shaping being performed such that said upper edge is shaped into a concavity disposed above said port opening in said inner wall of said cylinder and said lower edge is shaped into a concavity disposed below said port opening in said inner wall of said cylinder, each said concavity being arcuately recessed in both the axial and radial directions of said cylinder; and

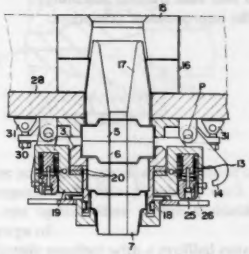
bevelling only the boundary edges common to and between said recessed concavities and the inner wall surface of said cylinder with a rotary member having a substantially smooth peripheral surface.

4,233,718

METHOD FOR APPLYING A DESIRED SEALING PRESSURE BETWEEN REFRACTORY PLATES OF SLIDING NOZZLE

Hiroshi Horiguchi, Ohmiya, and Terumoto Matsuo, Kitakyushu, both of Japan, assignors to Kurosaki Refractories Co. Ltd., Kitakyushu and Nippon Steel Corporation, Tokyo, both of, Japan

Division of Ser. No. 743,421, Nov. 19, 1976, Pat. No. 4,116,372.
This application Jul. 13, 1977, Ser. No. 815,323
Claims priority, application Japan, Nov. 26, 1975, 50-141791
Int. Cl.³ B23P *15/00*; B22D *41/08*
U.S. Cl. 29—157 C **4 Claims**



1. A method for applying and maintaining a desired sealing pressure between stationary and slidable refractory plates of a sliding nozzle assembly used in the regulation of the flow of molten metal from a vessel comprising:

positioning a sliding nozzle assembly which includes stationary and slidable refractory plates across the discharge opening of a vessel containing a molten metal,

providing said sliding nozzle assembly and vessel with mounting means for detachably connecting a fluid pressure control device thereto,

temporarily mounting said readily detachable fluid pressure control device to said sliding nozzle assembly and vessel,

applying a controlled pressure by said fluid pressure control device to said refractory plates so that a desired sealing force is effected at the interface between said stationary and slidable plates,

rigidly connecting said plates together by connecting means after said controlled pressure has been applied by said pressure control device,

maintaining said desired sealing force by means of said connecting means, and

removing said pressure control device from said sliding nozzle assembly, whereby said pressure control device is not subjected to the temperature of the molten metal during operation of the sliding nozzle assembly.

4,233,719

METHOD FOR MANUFACTURING A HEAT TRANSFER ASSEMBLY

Eugene E. Rhodes, Belleville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 6, 1978, Ser. No. 940,932
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.3 A **2 Claims**

1. In the method for manufacturing a heat transfer assembly comprising the steps of:

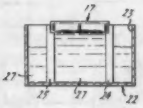
(a) forming a plurality of fin strips, each of said fin strips being made from a unitary strip of metal folded back and forth to form a plurality of fin elements each having an essentially planar member between the fold edges;

(b) forming a plurality of substantially flat-sided metal tubes, said tubes being seamless or having seams that are welded or otherwise sealed;

(c) cleaning said fin strips and said tubes with flux to remove surface oxidation and contaminants therefrom;

(d) forming a heat transfer assembly by the assembly of a plurality of said fin strip and tubes, at least one flat side of each of said tubes being in conductive heat transfer contact with a plurality of the fold edges of at least one of said fin strips through solder joints made at the locations of said conductive heat transfer contact, said solder joints being made by the application of solder to selected components in said heat transfer assembly and by the application thereafter to said heat transfer assembly of heat and temperature sufficient to cause said solder to flow, thereby, to join said selected components to other components in said heat transfer assembly;

wherein the improvement comprises:



(e) prior to the assembly of said fin strips and tubes, applying solder as a bead extending along a majority of the length of said fold edges of said fin strips, the solder bead on the fold edges being applied to said fold edges by causing said fin strips to pass through liquid solder which thereafter solidifies on said fold edges as beads, the liquid solder being in a vessel, the surface of the liquid solder having a standing wave generated therein whereby a solder peak is formed, the metal from which said fin strips are formed, after being folded back and forth to form said fold edges, having said fold edges pass through the solder peak in said vessel; and

(f) said heat and temperature thereafter applied to said heat transfer assembly causing solder to flow from said fold edges to said tubes, thereby, to form said solder joints made at locations of said conductive heat transfer contact.

4,233,720

METHOD OF FORMING AND ULTRASONIC TESTING ARTICLES OF NEAR NET SHAPE FROM POWDER METAL

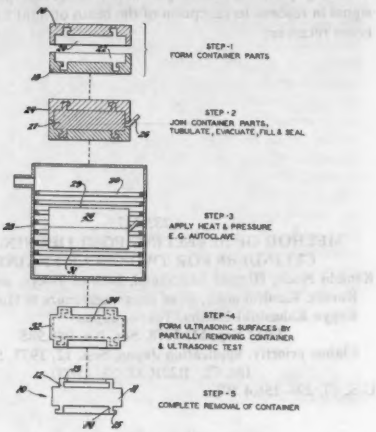
Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Nov. 30, 1978, Ser. No. 965,168

Int. Cl.² B23Q *17/00*

U.S. Cl. 29—407 **2 Claims**

1. A method of forming and sonic testing powder metal articles comprising the steps of producing a thick-walled container by forming a cavity of predetermined complex shape in a mass of suitable container material such that the walls of the container are of sufficient thickness so that the exterior surface thereof does not closely follow the contour of the cavity, cleaning the cavity to remove contaminants, filling the cavity with powder metal and sealing the container, applying heat and pressure to the container to consolidate the powder metal to produce a densified compact, preparing the densified compact for sonic testing by selectively removing portions of the container to form sonic surfaces on the jacket of container material around the densified compact, sonic testing the densified compact and completing removal of the container material.



4,233,721

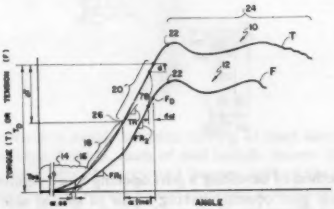
TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 912,151, Jun. 2, 1978, which is a continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,358

Int. Cl.² B25B *23/14*; B23Q *5/00*; G01L *3/22*

U.S. Cl. 29—407 **8 Claims**



1. A method for tightening a threaded fastener, comprising

applying torque and imparting rotation to the fastener for advancing the fastener into a region of increasing torque and increasing rotation;

sensing applied torque at a plurality of rotational locations; then

stopping rotation of the fastener; then

determining the torque rate of the fastener in a region preceding stopping of rotation including

disregarding at least those torque sensings immediately preceding stopping of rotation where the magnitude of the sensing is affected by the act of stopping rotation;

selecting a plurality of torque sensing sensed at rotational locations lower than the disregarded sensings; and

averaging the selected torque sensings into an average torque rate.

4,233,722

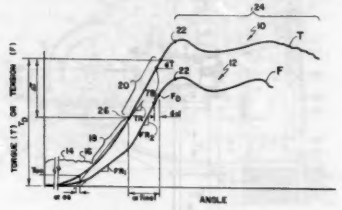
TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 912,151, Jun. 2, 1978, Pat. No. 4,179,786, which is a continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, and Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,363

Int. Cl.[3] B23P *19/06*

U.S. Cl. 29—407 16 Claims



1. A method of tightening a threaded fastener including the sequential steps of

tightening the fastener with a powered instructable tool;

suspending tightening and measuring the amount of tool overrun;

resuming tightening; and

instructing the tool to terminate tightening as a function of the measured tool overrun.

4,233,723

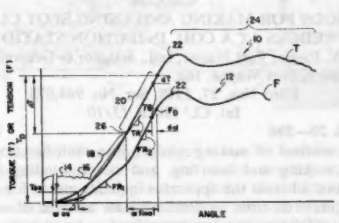
TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 912,151, Jun. 2, 1978, Pat. No. 4,179,786, which is a continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, and Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,686

Int. Cl.[3] B23P *19/06*

U.S. Cl. 29—407 4 Claims



1. A method of monitoring performance of a tool during tightening of a threaded fastener, including

tightening the fastener with the tool;

predicting the amount of tool overrun;

causing the tool to terminate tightening and measuring the amount of actual tool overrun; and

signalling in the event that the measured tool overrun diverges significantly from the predicted tool overrun.

4,233,724

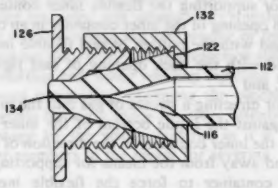
METHOD OF ACCURATELY POSITIONING FIBER CABLES WITHIN FERRULES

Terry P. Bowen, Etters; Charles D. Hoover, Harrisburg; Gilbert D. Ferdon, Hummelstown, and Robert G. Harwood, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 819,919, Jul. 28, 1977, Pat. No. 4,167,303. This application Apr. 20, 1979, Ser. No. 31,903

Int. Cl.[3] B23P *19/00*

U.S. Cl. 29—428 8 Claims



1. A method for accurately positioning fibers of optical fiber cables within respective ferrule members, each said cable having at least one optical fiber within a shielding jacket, comprising the steps of:

forming said ferrule member with a profiled outer surface at a front end and an axial blind bore extending therein from a rear end,

mounting said ferrule member in a bushing which exerts radially compressive force on said front end,

drilling a bore coaxially with said bushing to intersect said blind bore,

releasing said bored ferrule member from said bushing,

inserting said at least one optical fiber of said cable into said ferrule member to pass through said bores, and

securing said at least one fiber therein whereby said at least one fiber is accurately positioned within said ferrule in all subsequent matings thereof.

4,233,725

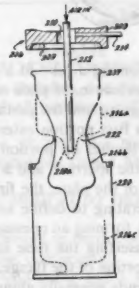
METHOD AND APPARATUS FOR INSERTING A FLEXIBLE INNER CONTAINER WITHIN A RIGID OUTER CONTAINER

Norman D. Burger, Culver City, Calif., assignor to Nicholas A. Mardesich, Palos Verdes Estates, Calif., a part interest

Division of Ser. No. 774,896, Mar. 7, 1977, Pat. No. 4,150,522. This application Feb. 9, 1979, Ser. No. 10,899

Int. Cl.[3] B23P *19/02, 11/02*

U.S. Cl. 29—451 5 Claims



1. A method for inserting a flexible inner container having a bottom surface within a rigid outer container having a neck opening in the formation of an aerosol dispensing system, said method comprising:

aligning a bottom surface of the flexible inner container with said neck opening, and

applying a pressure to the inside of said aligned bottom surface of said inner container to force said bottom surface through the neck opening with the balance of the inner container being pulled by the bottom surface into the rigid outer container.

5. An apparatus for inserting a flexible inner container through a neck opening of a rigid outer container in forming an aerosol system in which the flexible inner container has a mouth opening and a bottom, said apparatus comprising:

means for supporting the flexible inner container with the mouth opening of the inner container in an opened condition and with the bottom of said flexible inner container aligned with the neck opening of said rigid outer container, and

means for directing a stream of gas into the mouth opening and against the inside bottom of the inner container to move the inner container in the direction of the stream of gas and away from the means for supporting the flexible inner container to force the flexible inner container through the neck opening of a rigid outer container by directing the said stream of gas toward the neck opening.

4,233,726

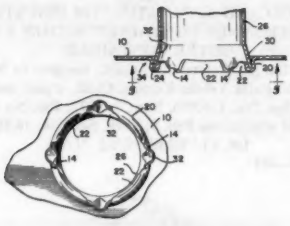
METHOD OF JOINING A TUBE TO A PLATE

Ronald S. Williams, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.

Division of Ser. No. 908,393, May 22, 1978, Pat. No. 4,195,943. This application Dec. 21, 1978, Ser. No. 972,043

Int. Cl.³ B21D *39/00;* **B23P** *11/02*

U.S. Cl. 29—507 **8 Claims**



1. The method of joining a tube to a plate comprising the steps of forming an aperture in the plate where the tube is to be joined, forming a flange around the perimeter of the aperture, the flange including a first portion extending away from the plane of the plate, a second lip portion extending generally radially of the axis of the aperture, and a third portion extending toward the plane of the plate, the first, second, and third flange portions cooperating to define an annular groove for receiving the tube end, forming an opening in one of the flange and tube side wall, inserting the tube into the aperture into contact with the lip portion of the flange, the flange including a side wall which extends generally along the side wall of the inserted tube, the opening extending longitudinally and perimetrally of the tube and flange, and deforming the other of the flange and tube side wall radially into the opening to capture the tube against rotation and longitudinal movement with respect to the flange.

4,233,727

ATTACHMENT FOR SCREW-TIGHTENING DEVICES, PREFERABLY FOR REACTOR PRESSURE VESSELS

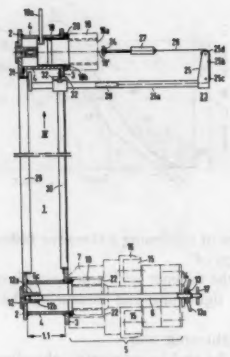
Anton Kautetzky, Forchheim, and Otto Müller, Effeltrich, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 930,977

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736733

Int. Cl.³ B25B *29/02*

U.S. Cl. 29—560 **14 Claims**



1. Accessory for a screw-tightening device having a support ring with hydraulic piston-cylinder assemblies as tensioning elements for pressure-vessel cover screws, the assemblies being disposable on a flange of the pressure-vessel cover, fastening nuts for the cover screws being loosenable and tightenable as well as transportable by the screw-tightening device, comprising a divided auxiliary ring having parting gaps formed in a circumferential region thereof corresponding to a circumferential region of the support ring at which parting gaps are likewise formed, said auxiliary ring and said support ring being mutually superimposable and clampable, said divided auxiliary ring having the parts thereof provided with respective means for engagement by a lifting tool, said rings having flange connections at said parting gaps thereof, said flange connections being disconnectible to form at least two separate arcuate units respectively including part of the support ring and part of said auxiliary ring clamped together for transport by said lifting tool.

4,233,728

METHODS FOR MAKING AND USING SLOT CLOSURE WEDGES AT A COIL INJECTION STATION

Louis W. Pieper, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

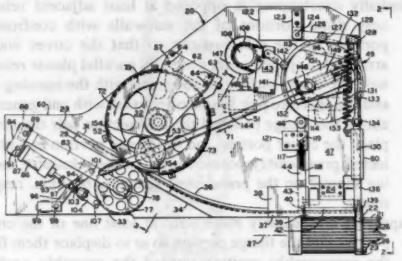
Filed Nov. 27, 1978, Ser. No. 964,075

Int. Cl.³ H02K *15/10*

U.S. Cl. 29—596 **5 Claims**

1. A method of making wedges in a multifunction, stator wedge making and inserting, and stator winding injecting apparatus, wherein the apparatus includes means for severing wedge material from an indeterminate amount of supply of such material having a predetermined and generally uniform thickness, in order to establish pieces of wedge material of a determinate length, wherein the apparatus includes a wedge magazine having a plurality of locations for receiving the pieces of wedge material of a determinate length, and wherein the apparatus further includes means for transferring the pieces of wedge material of a determinate length into the wedge magazine; the method comprising: pinching wedge material between two roller members and advancing a predetermined length of the material from the material supply toward the

means for transferring, while also reducing the thickness of the wedge material at preselected locations where the material is being pinched and thereby forming the wedge material into a predetermined symmetrical shape having a central portion and two leg portions with the junctures and dimensions of the leg portions and the central portion being accurately defined by reduced thickness segments of the wedge material that are established by said pinching of the wedge material; severing



the same predetermined length of previously pinched wedge material with the means for severing to establish a wedge of finite length; transferring the severed predetermined length of previously pinched wedge material to the wedge magazine; and subsequently transferring part of at least one stator winding and said wedge of finite length into a slot of a stator core with said multifunction stator wedge making and inserting and stator winding injecting apparatus.

4,233,729

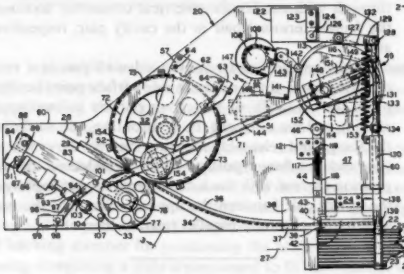
APPARATUS AND METHODS FOR MAKING AND USING SLOT CLOSURE WEDGES AT A COIL INJECTION STATION

Fredrick Koenig, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Nov. 27, 1978, Ser. No. 964,076

Int. Cl.³ H02K *15/10*

U.S. Cl. 29—596 **11 Claims**



1. In a method of making wedges in a multi-function, stator wedge making and inserting, and stator winding injecting apparatus, wherein the apparatus includes means for severing wedge material from an indeterminate amount of supply of such material having a predetermined and generally uniform thickness, in order to establish pieces of wedge material of a determinate length, wherein the apparatus includes a wedge magazine having a plurality of locations for receiving the pieces of wedge material of a determinate length, and wherein the apparatus further includes means for transferring the pieces of wedge material of a determinate length into the wedge magazine; and wherein the method comprises: pinching wedge material between two roller members and advancing a predetermined length of the material from the material supply toward the means for transferring, while also reducing the thickness of the wedge material at preselected locations where the material is being pinched and thereby forming the wedge material into a predetermined symmetrical shape having a central portion and two leg portions with the junctures and dimensions of the leg portions and the central portion being accurately defined by reduced thickness segments of the wedge material that are established by said pinching of the wedge material; severing the same predetermined length of previously pinched wedge material with the means for severing to establish a wedge of finite length; transferring the severed predetermined length of previously pinched wedge material to the wedge magazine; and subsequently transferring part of at least one stator winding and said wedge of finite length into a slot of a stator core with said multifunction stator wedge making and inserting and stator winding injecting apparatus; the improvement comprising: confining the pinched wedge material in a guide having a shape to insure retention of said symmetrical shape by the wedge material as it is advanced from the roller members to the means for severing.

4,233,730

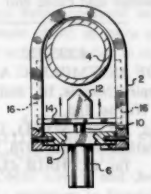
BOILER TUBE PULLING METHOD AND APPARATUS

James R. Godbe, P.O. Box 35429, Dallas, Tex. 75235

Filed Jul. 31, 1978, Ser. No. 929,279

Int. Cl.³ B23P *15/26*

U.S. Cl. 29—727 **6 Claims**



1. Apparatus for breaking the bond between a tube and a tube sheet comprising:

a substantially rigid tube engaging member having a concave surface conforming to substantially half the circumference of a tube,

driving means attached to said tube engaging member, and

a crimping wedge attached to the driving means and positioned opposite of said concave surface to be driven toward said concave surface by said driving means.

4,233,731

RESILIENT CONNECTOR

Robin J. T. Clabburn, Swindon, and Richard J. Penneck, Lechlade, both of England, assignors to Raychem Limited, London, England

Filed Jan. 17, 1978, Ser. No. 870,184

Claims priority, application United Kingdom, Jan. 24, 1977, 2832/77

Int. Cl.³ H01R *43/00*; H02G *15/08*

U.S. Cl. 29—859 **19 Claims**

16. A method of forming an earth connection to an end of a mineral-insulated cable, comprising:

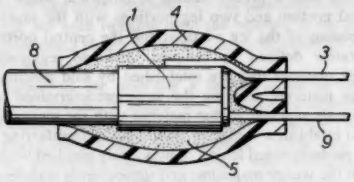
(a) placing about said cable end a resiliently recoverable connector which comprises:

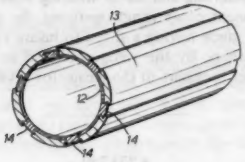
(i) a longitudinally slit tubular metal member, which has been elastically radially expanded,

(ii) a thermoplastic polymeric keeper placed within the slit to hold said member in its expanded state, the keeper

material being positioned substantially out of the path of radial recovery of said member, and

(iii) an earth lead connected to said member; and





(b) heating said keeper so that it weakens to permit said member to resiliently radially recover into tight gripping engagement about said cable end.

4,233,732

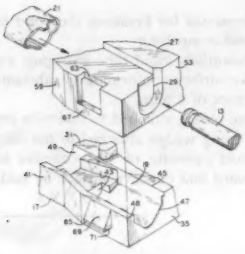
METHOD OF ASSEMBLING A RELAY DEVICE

Thomas J. Kindelspire, Morris, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 795,797, May 11, 1977, Pat. No. 4,158,828. This application Nov. 13, 1978, Ser. No. 959,913

Int. Cl.[3] **H01R** *43/00*

U.S. Cl. 29—881 **1 Claim**



1. A method of assembling a relay device having a flange portion and a cover portion adapted to be releasably secured together in a preselected assembly position and with at least the cover portion formed from a material having a resilient characteristic, the flange portion including a generally planar upper surface interconnected between a plurality of side surfaces depending therefrom, a pair of opposite facing latches on a pair of opposite side surfaces of the side surface plurality, and a pair of female terminal receiving cavities extending into the upper surface and intersecting with another one of the side surfaces of the side surface plurality interposed between the opposite side surface pair thereby to define therethrough a pair of intersections, respectively, the cover portion including a generally planar cover wall interconnected between a plurality of sidewalls depending therefrom, a pair of latch receiving openings in a pair of opposite sidewalls of the sidewall plurality and a pair of uninterrupted cavity communicating apertures in another one of the sidewalls of the sidewall plurality interposed between the sidewall pair, the method comprising the steps of:

placing a pair of female terminals in the cavities therefor of the upper surface and disposing a female electrical connector section of the female terminals at least adjacent the intersection pair for communication therewith, respectively;

initially overlapping in opposed at least adjacent relation only distal portions of the sidewalls with confronting portions of the side surfaces so that the cover wall is arranged in spaced apart generally parallel planar relation with the upper surface and aligning with the opening pair and the aperture pair in spaced relation with and generally above the wedge pair and the intersection pair thereby to place the cover portion and the flange portion in a preselected preassembly position prior to the releasable securing thereof on the preselected assembly position, respectively;

applying an assembly force onto at least one of the cover portion and the flange portion so as to displace them from the preassembly position toward the assembly position thereof;

moving in response to the applied assembly force the cover wall in a direction generally perpendicular toward the upper surface so as to maintain the generally parallel planar relation therebetween;

wedging the opposite sidewall pair at least in the vicinity adjacent the opening pair therein into engagement with the latch pair on the opposite side surface pair and spreading apart the opposite sidewall pair in the at least vicinity adjacent the opening pair therein in opposite directions generally away from the confronting portions of the opposite side surface pair respectively in the overlapping relation therewith at least generally simultaneously with the moving step;

then passing the opening pair in the opposite sidewall pair over the latch pair on the opposite side surface pair while the opposite sidewall pair are spread apart and moving the aperture pair in the another one sidewall generally into aligned overlapping relation with the intersection pair in the another one side surface so as to communicate therethrough with the female electrical connector sections of the female terminal pair in the cavity pair, respectively; and

resiling the spread apart opposite sidewall pair in a return direction toward the opposite side surface pair thereby to place the sidewalls of the cover portion in overlapping relation at least adjacent the confronting side surfaces of the flange and releasably securing thereby the cover portion and the flange portion in the preselected assembly position thereof with the female terminal pair captured in the cavity pair between the upper surface and the cover wall in the generally parallel relation thereof.

4,233,733

ELECTRIC SHAVER

George P. Gallanis, Des Plaines; Albert R. Spohr, Park Ridge, and Robert R. Lube, Countryside, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

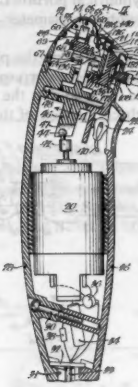
Filed Jan. 2, 1979, Ser. No. 46

Int. Cl.[3] **B26B** *19/04*

U.S. Cl. 30—43.92 **7 Claims**

1. A shaver comprising a housing, a shaving head detachably mounted on said housing, a skin engaging comb secured to said shaving head, a modular cutter assembly removably mounted in said shaving head adjacent said comb, and actuating means for actuating said cutter assembly, said cutter assembly includes a plurality of cutting blades secured together by pin

means, a blade mounting block including at least one spring arm releasably secured to said pin means and biasing means



mounted on said block for resiliently biasing said blades away from said block.

4,233,734

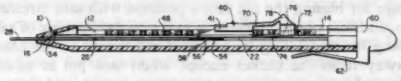
RETRACTABLE BLADE KNIFE

Sylvester W. Bies, Bloomfield, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Jan. 22, 1979, Ser. No. 5,022

Int. Cl.[3] B26B *1/08*

U.S. Cl. 30—162 **3 Claims**



1. A retractable blade knife comprising an elongated tubular handle of generally C-shaped cross-section having a longitudinally extending slot in one wall thereof formed with opposed parallel side edges, a flat thin elongate steel blade, a pair of opposed inwardly facing grooves inside the handle mounting the blade for sliding movement parallel to the slot, a longitudinally extending rib formed on one of said side edges and a row of contiguous teeth formed on the other of said side edges facing and in opposed relationship to the rib, a combined slide and latching member for positioning the blade relative to the housing comprising a slide dimensioned to fit between the side edges of the slot and having outwardly facing side grooves receiving the longitudinally extending rib and the row of teeth on the side edges of the slot whereby the slide is supported for sliding movement longitudinally of the handle, means releasably interconnecting the slide and the blade, a flexible thumbpiece extending upwardly and rearwardly from the slide and having a depending abutment at its free end extending inwardly between the longitudinally extending rib and the row of contiguous teeth, and a tooth carried by and extending outwardly from the side of the depending abutment of the thumbpiece facing and normally meshing with said row of teeth and being disengaged therefrom when the thumbpiece is flexed inwardly toward the handle thereby moving the thumbpiece laterally of the row of teeth.

4,233,735

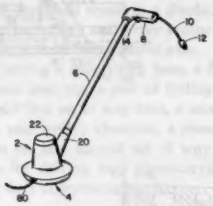
FLEXIBLE LINE CUTTING APPARATUS

William S. Tsuchiya, East Moline, Ill., assignor to The Toro Company, Minneapolis, Minn.

Filed Nov. 18, 1975, Ser. No. 632,972

Int. Cl.[2] B26B *27/00*

U.S. Cl. 30—276 **12 Claims**



1. Apparatus for cutting vegetation and the like comprising: a member rotatable about an axis normal to a cutting plane; means forming a continuous passageway in said member extending from a first opening intersected by said axis to a radially spaced second, tubular opening intersected by said cutting plane; flexible line means extending through said passageway and including a first end portion extending outwardly from said first opening and secured externally of said member against rotation with said member, and a second, free traveling end portion extending outwardly from said second, tubular opening, said line means being confined within said tubular opening and free to rotate about its own axis of elongation within said passageway as said member is rotated.

4,233,736

PRESSURE SENSITIVE PICTURE FRAME MAT OPENING CUTTER

Richard W. Duggins, Cedar Grove, and James W. Rodgers, Durham, both of N.C., assignors to Framework, Inc., Cedar Grove, N.C.

Continuation-in-part of Ser. No. 916,898, Jun. 19, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,660

Int. Cl.[3] B26B *29/00*

U.S. Cl. 30—293 **8 Claims**

1. A picture frame mat opening cutter comprising:

(a) a body member having a flat bottom adapted for being moved on the work surface of a picture frame mat during the forming of an opening therein and having a guide slot formed and disposed at a predetermined angle therein;

(b) a blade support bar slidably mounted in said guide slot and providing a blade mounting surface thereon;

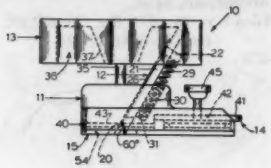
(c) a mat opening cutter blade having a cutting edge and detachably mounted on said blade mounting surface for slidable movement therewith to extend and retract said edge below and above said body member bottom;

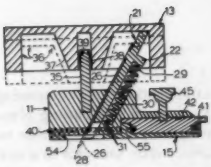
(d) compressible spring means mounted within said body member and operative to constantly tension said blade support bar and blade in a retracted blade edge direction;

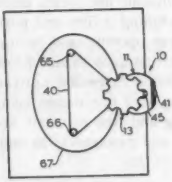
(e) vertical post means located on a top surface portion of said body member; and

(f) a knob member mounted for rotation and vertical sliding on said post means, said knob member having a manually operable knob portion and integral with said knob portion a guide portion providing a flat surface slidably engaging an upper end surface portion of said blade support bar thereby enabling said knob member when pressed downwardly by a downward force and while rotating on said post means to force said blade support bar and blade downwardly against the tension of said spring means to extend said cutting edge of said blade below said flat

bottom of said body member to a depth which within the limits of travel of said blade support bar and blade is







determined by the amount of said downward force applied to said knob member.

4,233,737

KNIFE WITH REMOVABLE BLADE

Paul W. Poehlmann, P.O. Box 445, Stinson Beach, Calif. 94970

Continuation of Ser. No. 873,506, Jan. 30, 1978, abandoned. This application Apr. 13, 1979, Ser. No. 29,847

Int. Cl.[3] B26B *1/00*

U.S. Cl. 30—335 **4 Claims**

1. A knife comprising

a removable blade having a tip at one end and having a tang with substantially parallel sides at the other end;

means in said tang between said sides defining a keyhole-shaped slot having parallel walls extending inwardly from said other end of the blade toward the tip and merging with an enlarged circular opening in said tang between said sides;

a handle assembly;

means in said handle assembly including side plates defining a longitudinal socket between them and adapted to receive the tang sides in close fitting relationship;

means in one of said side plates defining a circular opening into one side of said socket;

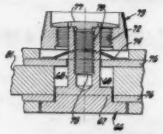
means in the other of said side plates defining an oppositely located, non-circular aperture opening into the other side of said socket;

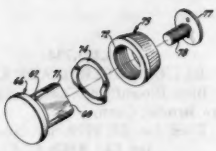
a generally circular-cylindrical blade-locking pin extending through said aperture, socket and opening, and having axial movement therein between transverse extreme positions;

heads at opposite ends of said pin adapted to abut said side plates thereby limiting said transverse movement;

said pin for a part only of its length having a non-circular portion between opposite flats, the dimension across said flats establishing slidable engagement of said flats with the parallel walls of the keyhole slot in the tang, and the diameter of the cylindrical portion of the pin corresponding substantially with the diameter of said tang circular opening;

the free length of the flats along the pin when the pin is at one of said extreme positions corresponding at least to the width between the tang sides at the keyhole-shaped slot, the circular-cylindrical portion of the pin projecting into





the socket when the pin is at the other of said extreme positions;

means for biasing the pin into a position with said circular-cylindrical portion thereof in said circular opening of said tang for preventing longitudinal movement of the blade away from the socket except when said pin is axially moved against said biasing means to permit said flats to slide between said parallel sides of said keyhole slot;

and lock means movable into and out of a position for positively preventing axial movement of said pin.

4,233,738

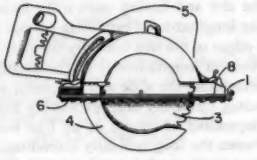
GLIDE PAD FOR PORTABLE POWER SAW

Ted R. Dedrick, 6145 Lubbock Ave., La Mesa, Calif. 92041

Filed Nov. 16, 1978, Ser. No. 961,218

Int. Cl.[2] B27B *9/04*

U.S. Cl. 30—374 **4 Claims**



1. A glide pad for a portable power saw having a metallic table, comprising:

(a) a substantially rigid planar deck of plastic or metal having an upturned leading edge conforming to the table of a

portable power saw and including an elongated, longitudinally-extended slot to accommodated the blade of said saw;

(b) a layer of non-abrasive material bonded to the bottom of said deck;

(c) said deck having means for mounting same flush against the bottom of said table with said slot aligned with the blade of said saw.

4,233,739

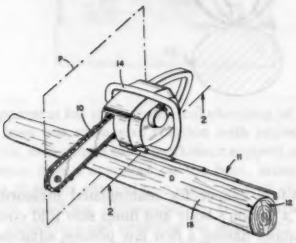
CHAINSAW ACCESSORY

Leslie W. Hinrichs, Box 176, Summerland, Calif. 93067

Filed Jul. 16, 1979, Ser. No. 57,791

Int. Cl.³ B27B *17/00*

U.S. Cl. 30—383 **2 Claims**



1. A chainsaw accessory for use in combination with a portable chain saw to define a fixed pre-determined distance of the cutting plane of said saw from an end of work to be cut so that successive cuts of identical lengths can be rapidly made, said accessory comprising a plurality of straight cylindrical tubes of progressively decreasing diameter so that they can be nested in telescoped relationship, the outermost tube being secured to said chain saw in a position such that the telescoped tubes can be extended in a direction normal to said plane, the outer opening end of each tube from which the next successive tube extends being peened radially inwardly so that the outer end of said next successive tube is frictionally engaged over 360°, the inner end opening of each tube surrounded by the next larger tube being flared outwardly to frictionally engage over 360° the inner wall of said larger tube, whereby any length to which the tubes are extended will be maintained by said frictional engagement of the tubes so that said fixed predetermined distance can be changed and retained in the changed position.

4,233,740

PHOTOGRAMMETRIC PLOTTER AND CONSTRAINT FREE DRIVE SYSTEM THEREFORE

Robert F. Bunn, Clinton, Md., and Clifford W. Greve, Arlington, Va., assignors to Autometric Incorporated, Beltsville, Md., by said Clifford W. Greve

Filed Feb. 16, 1979, Ser. No. 12,689

Int. Cl.³ F16H *27/02*; G02B *27/22*

U.S. Cl. 33—1 A **14 Claims**

1. A photogrammetric instrument having a supporting base, way bars mounted on said supporting base and a photocarriage stage mounted on said way bars for translation along at least one selected axis, position transducer means for sensing the position of said photocarriage stage along said at least one axis and producing an electrical signal indicative of said position and drive motor means operating between said base and said photocarriages stage for driving said photocarriages stage relative to said supporting base along said axis, improvement in said drive motor means comprising

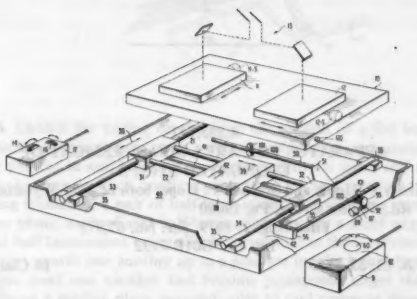
a drive rod having a longitudinal axis which is substantially parallel to said at least one axis,

means supporting said drive rod on one of said (1) supporting base, (2) photocarriage stage so as to allow said rod to pivot and move transverse to its longitudinal axis,

said drive motor means including means for engaging said drive rod, and

means mounting said drive motor means on the other one of said (1) supporting base, (2) photocarriage stage such that any non-parallelism between said drive rod and the movement along said one axis will result in a displacement of said drive rod with respect to said drive motor means in directions transverse to said longitudinal axis.

8. In a stereoplotter having a supporting base, a first set of way bars mounted in said base and a pair of trolley elements movably mounted on said first set of way bars, a second set of way bars supported on said trolley elements, a photocarriage mounted for movement on said second set of way bars, the improvement in means for driving said photocarriage along one of said sets of way bars comprising,



a drive rod extending parallel to the direction of drive along one of said sets of way bars,

means mounting one end of said drive rod on one of said pair of trolley elements so that said rod is displaceable transverse to the direction of drive,

a rotatable drive wheel and motor for rotating same, and,

means causing said drive wheel to bear on said drive rod, said drive rod being rigidly supported at said one end only in an axial direction, the mounting of said drive rod at said one end being in and permitting movements of said rod transverse to the direction of drive and the longitudinal axis of said drive rod whereby any non-parallelism between the set of way bars establishing direction of drive of said photocarriage and said drive rod results in movement of said drive rod in the fashion stated.

4,233,741

MAP READING DEVICE

Claude O. Bisset, Johannesburg, South Africa, assignor to Hausler Scientific Instruments (Proprietary) Limited, Transvaal, South Africa

Filed Apr. 16, 1979, Ser. No. 30,488

Claims priority, application South Africa, Apr. 17, 1978, 78/2179

Int. Cl.³ G01B *3/56*

U.S. Cl. 33—1 N **4 Claims**

4. A map reading device comprising:

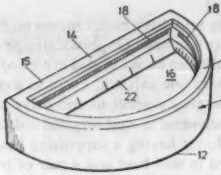
(a) a housing open at the top and the bottom, defined by a semicircular wall and a straight wall;

(b) inturned edges on the top of said walls forming recesses;

(c) tritium-powered microlight containing tubes secured in the recesses defined by said inturned edges and the inside of said walls;

(d) an inclined portion formed on the internal walls of said housing, said inclined portion adapted to be illuminated by said micro lights;

(e) angular graduations on the inclined portion of said semi-circular wall; and



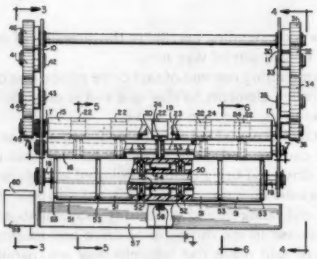
(f) a central graduation mark on the inclined portion of said straight wall.

4,233,742

APPARATUS FOR AREA MEASUREMENT OF ELONGATED STRIPS

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed Aug. 2, 1979, Ser. No. 62,971
Int. Cl.[3] G01B 7/32
U.S. Cl. 33—123 **14 Claims**



1. Apparatus for measurement of area of elongated strips of different width and length which comprises

width and length sensing means for said strip comprising

a driven roller for engagement by the strip as determined by its width and length and having a plurality of spaced grooves thereon,

a shaft fixedly mounted in spaced parallel relation to said driven roller,

a plurality of spaced roller members freely pivotally mounted on said fixedly mounted shaft and each having a force transfer portion for simultaneous engagement by the strip with said driven shaft member and said spaced roller members as determined by the width and length of the strip,

each of said force transfer portions extending into one of said grooves for actuation of said roller members upon engagement of a portion of a strip therewith,

activating members responsive to rotary movement of said roller members as determined by engagement of a strip with said roller members and

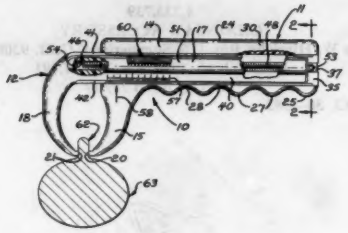
fixedly mounted members responsive to movement of said activating members as determined by the width and length of the strips.

4,233,743

SKIN-FOLD CALIPER

Francis S. Flick, Oakbrook, Ill., assignor to Health & Education Services Corporation, Bensenville, Ill.

Filed Feb. 3, 1977, Ser. No. 765,090
Int. Cl.[3] G01B 3/38
U.S. Cl. 33—143 C **2 Claims**



1. A skin-fold caliper for manipulated measuring of the thickness of a person's body and limbs skin fold comprising:

a base member having a first jaw portion adjacent one end and a handle portion defining its other end, said base member having a dovetail-shaped recess defined therein, said recess having an end open at the first jaw end and extending toward the handle end, said jaw portion having a nib facing axially outward from the first jaw end;

a slide member having a second jaw portion adjacent one end and a mounting portion defining its other end, said mounting portion having a sectional size and configuration corresponding to said recess so that said mounting portion is axially slidable therein when inserted into the open end of said recess, said base member and said slide member thereby having respective opposing surfaces slidable relative to each other, said base member having a first axially-extending channel formed in its opposing surface, said first channel opening toward said slide member and having an end open at the first jaw end, said slide member having a second axially-extending channel formed in its opposing surface, said second channel opening toward said base member opposite said first channel and having an end open at the mounting end so that said first and second channels together defining a hollow housing;

a coiled spring within said housing;

first means carried by said base member in the housing adjacent the handle end for attaching one end of said spring thereto;

second means carried by said slide member in the housing adjacent the second jaw end for attaching the other end of said spring thereto so as to urge said jaw portions closed;

gripping means integrally formed on said base member providing increased gripping capability for an operator's hand;

gripping means integrally formed on said slide member for providing increased gripping capability for an operator's thumb so that said jaw portions may be manually opened against the pressure of said spring by an operator using one hand; and

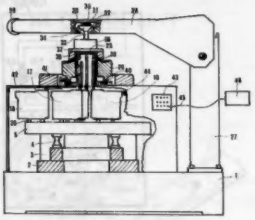
scale means on said slide member and said base member juxtaposed for visual identification of the distance between said nibs thereby providing an indication of the thickness of a skin fold clamped between said nibs under spring pressure.

4,233,744

APPARATUS FOR THE GEOMETRICAL CHECKING OF WORKPIECES HAVING SURFACES OF ROTATION

Mario Possati, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino, Italy

Filed Dec. 1, 1978, Ser. No. 965,402
Int. Cl.[3] G01B 7/14
U.S. Cl. 33—143 L 12 Claims



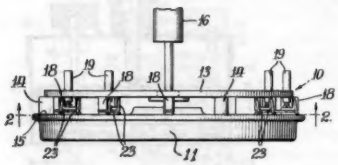
1. An apparatus for the geometrical checking of workpieces having at least one surface of rotation with respect to a geometrical axis, including a base, workpiece support and mechanical reference means mounted on the base, measuring heads with feeler elements adapted to co-operate with the surface of rotation for checking dimensions in a diametral direction, means for supporting and adjusting the position of the measuring heads carried by the base, and indication means connected to the measuring heads, and in which the feeler elements of the heads lie in a plane passing through the geometrical axis, said means for supporting and adjusting include a plurality of guides placed beside one another in an established direction, each guide being adapted to support an associated group of said measuring heads and enabling the displacement of the associated heads according to an axis perpendicular to said geometrical axis, the feeler elements of the measuring heads remaining—during the displacement—in said plane, said established direction being perpendicular to this plane.

4,233,745

WARPAGE GAGE

Thomas Ramon, Park Forest, Ill., and Richard O. Peck, Lakewood, Colo., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Oct. 28, 1976, Ser. No. 736,563
Int. Cl.[3] G01B 7/02, 7/28
U.S. Cl. 33—174 L 7 Claims



1. A warpage gage for railroad wheels and the like comprising:

a generally circular, planar support means;

at least three spaced spacer means affixed near the edge of said support means and adapted to seat against a generally planar surface to be gaged thereby positioning said support means at a predetermined distance from said planar surface;

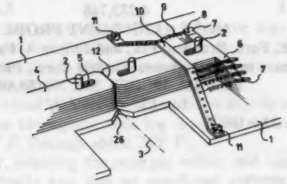
and a plurality of spaced displacement gages affixed near the edge of said support means, each adapted to seat against the planar surface to be gaged, each of said displacement gages generating a signal representative of the displacement thereof, said signals thereafter being utilized to determine the warpage of the planar surface.

4,233,746

DEVICE FOR TESTING THE SECTION OF A FLAT KEY

Willy Troillet, 48, Chemin de Cressy, CH-1213 Onex, Geneva, Switzerland

Continuation of Ser. No. 873,942, Jan. 31, 1978, abandoned. This application Apr. 10, 1979, Ser. No. 28,676
Claims priority, application Belgium, Jan. 31, 1977, 850914
Int. Cl.[3] G01B 5/20
U.S. Cl. 33—174 F 6 Claims



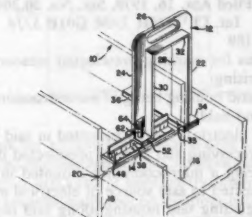
6. Device for testing or checking the section of a flat key which comprises a base plate, a plurality of laminations extending parallel to said base and superimposed to the latter and to one another in stack configuration, each of said laminations being formed of a pair of half-laminations extending ina common plane, each of said half-laminations having a front edge, said half-laminations being slidably mounted in their common plane towards one another up to a position in which said front edges meet one another and become juxtaposed edges thus defining a median plane perpendicular to said common plane, and away from each other at least to the extent necessary for the introduction of a key between said juxtaposed edges of said half-laminations, and means for applying a pressure to the stack of laminations to fix the individual half-laminations in a position which corresponds to the predetermined cross-sectional profile or shape of the flat key to be checked as given in said median plane, each of said half-laminations having at its end remote from said front edge at least one lug extending laterally, the lateral lugs of the various laminations when considered from the bottom to the top of the stack, having a decreasing length from one lamination to the next following and having their ends each time somewhat bent upwards.

4,233,747

THREE DIMENSIONAL LAYOUT TOOL

Richard A. Fisher, Cheasapeake, Va., assignor to Globe Iron Construction Co., Inc., Norfolk, Va.

Filed Sep. 27, 1979, Ser. No. 79,444
Int. Cl.[3] G01B 5/14; B23Q 35/02
U.S. Cl. 33—174 R 5 Claims



1. A tool for layout of H beams, comprising a U shaped frame having a first leg, a second leg and a rib joined to one

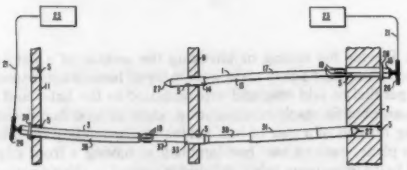
end of each leg, said first leg being longer in length than said second leg and terminating at its other end in a rectangular bar extending laterally and perpendicularly of said first leg, said rectangular bar having a flat wear surface adapted to be positioned against an outer surface of the beam to establish a point from which all dimensions are taken, said second leg having a channel at its other end, a T scale having a base and a vertical leg, means for slidingly receiving said vertical leg in said channel such that the lower surface of said base is adapted to be disposed flat on the surface of said web and a locking mechanism on said second leg for locking said scale in a predetermined position.

4,233,748

HOLE ALIGNMENT PROBE

Daniel E. Ford, Brandon, Fla., and Jeffrey A. Pyle, Greer, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 19, 1979, Ser. No. 58,894
Int. Cl.³ G01B 7/31
U.S. Cl. 33—180 R **9 Claims**



1. A hole alignment probe for determining the misalignment of holes in spaced-apart plates, said probe comprising:

an elongated rod, said rod having at least three lands slightly smaller in diameter than the holes in said plates and spaced generally the same as said plates and having a turned down portion disposed between adjacent lands;

at least two strain gages disposed on one of said turned down portion 90 degrees apart;

cables extending from said strain gages;

at least one cable run disposed to bring said cables through one of said lands without interfering with the fit between the land and the associated hole;

means for determinng the orientation of the strain gages;

whereby upon insertion of the probe in aligned holes in adjacent plates and by determining the strain registered by the strain gages the amount and direction of misalignment of the holes can be determined.

4,233,749

APPARATUS FOR MEASURING AND MARKING PRESELECTED MEASUREMENTS

Howard W. Coulter, 12 Oakcrest Dr., Pekin, Ill. 61554, and Dennis R. Triggs, 348 E. Fernwood St., Morton, Ill. 61550

Filed Apr. 16, 1979, Ser. No. 30,304
Int. Cl.³ B25H 7/04; G01B 5/14
U.S. Cl. 33—189 **9 Claims**

1. Apparatus for marking preselected measurements on an object, comprising:

a housing, said housing being of a construction sufficient for being hand-held;

a source of electrical energy mounted in said housing;

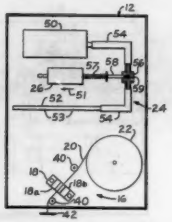
means for receiving and storing preselected data, said data means being a microcomputer mounted in said housing and connected to said source of electrical energy;

means for guiding said housing along said object in a substantially straight line, said means including a member extending from said housing for engagement with said object;

a storage member attached to said housing;

means for measuring preselected distance on said object, said measuring means connected for being extended from and retracted to said storage member, said measuring means being marked at equally spaced intervals;

means, connected to said energy source, for electrically sensing movement of said intervals when said measuring means is extended from said storage member, and for registering movement of said intervals with said preselected data; and



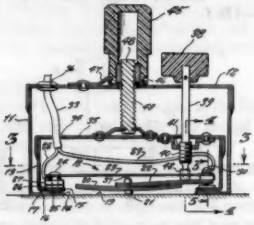
means, connected to said enegy source, for marking said object in response to said registered movement of said intervals, said marking means being electrically energized for urging a color impregnated marking medium into repeated momentary contact with said object in a spaced marking pattern corresponding to said preselected stored data.

4,233,750

ADJUSTABLE SURFACE TEMPERATURE DETECTOR

Sheng-Hsiung Cheng, P.O. Box 17092, West Hartford, Conn. 06117

Filed Dec. 26, 1978, Ser. No. 973,148
Int. Cl.³ H01H
U.S. Cl. 337—374 **3 Claims**

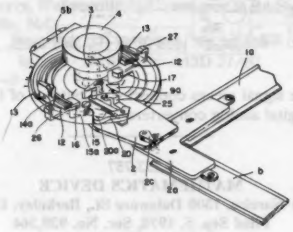


1. An adjustable surface temperature detector, comprising in combination, an outer case, an inner case vertically adjustable in said outer case and carrying a switch mechanism, a hole in a bottom wall of each said case so that said mechanism contacts a supporting surface upon which said detector is placed; said mechanism including a bimetallic sensor disc secured by a rivet to a bimetallic sensor strip, and said mechanism includes an aluminum strip above said rivet for being contacted thereby when a temperature of said surface is raised, said strips each being connected by a conductor in an electric circuit with an alarm and a power source.

4,233,751
UNIVERSAL PARALLEL RULER FOR THREE-DIMENSIONAL DRAWING

Masao Koenuma, Tokyo, and Yoshitaka Gibu, Wakou, both of Japan, assignors to Asahi Seimitsu Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1979, Ser. No. 30,738
Claims priority, application Japan, Apr. 20, 1978, 53-46828; Jun. 12, 1978, 53-70665
Int. Cl.³ B43L *13/14*
U.S. Cl. 33—434 **14 Claims**



1. A universal parallel ruler for a three-dimensional drawing including a protractor disc and at least one scale, comprising:

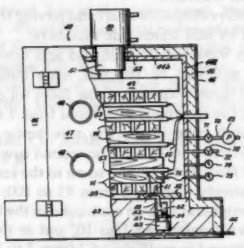
preset stopper means corresponding to at least one of said the basic three axes of said three-dimensional drawing, said preset stopper means for angularly adjusting said at least one scale relative to said protractor disc; and

scale supporting means for supporting said at least one scale, said scale supporting means positively engaging said preset stopper means for angularly setting said at least one scale to align said scale with one of the basic three axes of said three-dimensional drawing.

4,233,752
APPARATUS AND PROCESS FOR TREATING WOOD AND FIBROUS MATERIALS

Robert A. Kleinguenther, Rte. 4, Box 433, Seguin, Tex. 78155

Continuation-in-part of Ser. No. 787,881, Apr. 15, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,760
Int. Cl.³ F26B *3/00, 7/00, 5/04*
U.S. Cl. 34—9.5 **11 Claims**



1. A process for removing acids, salts and other chemical products from wood to upgrade the quality of said wood comprising the steps of

(1) placing at least one piece of wood in a closed chamber,

(2) applying a vacuum in the order of 0.005–700 mm. Hg to said chamber,

(3) introducing a fluid into said chamber adapted to neutralize said chemical products in said wood,

(4) increasing the atmospheric pressure in said chamber to 2–200 atmospheres,

(5) reducing the atmospheric pressure in said chamber to room pressure,

(6) removing the fluid from said chamber, and

(7) removing the wood from the chamber.

4,233,753
METHOD FOR PREVENTING THE SPLITTING OF LOGS DURING DRYING

Alvin E. Olson, Beaverton, Oreg., assignor to Allwood, Inc., Portland, Oreg.

Filed Jan. 22, 1979, Ser. No. 5,662
Int. Cl.³ F26B *5/04*
U.S. Cl. 34—16.5 **2 Claims**

1. A method for preventing splitting of whole logs during the drying thereof, comprising:

(a) placing a whole log in a pressure containment vessel and sealing said vessel;

(b) after said vessel is sealed, injecting steam therein until the temperature throughout said log is within the range of about 190° F. through about 240° F.;

(c) thereafter, releasing the pressure within said vessel at a rate sufficiently low that no significant collapse of the wood within said log occurs, until ambient atmospheric pressure is reached;

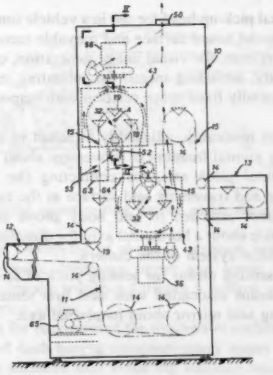
(d) debarking said log; and

(e) after steps (c) and (d), storing said log in an atmosphere controlled to maintain no less than about 45% relative humidity until the moisture content in said log has been reduced to a predetermined amount.

4,233,754
APPARATUS FOR ULTRAVIOLET DRYING AND/OR CURING OF SOLVENT-FREE INK ON THREE-DIMENSIONAL ARTICLES

Jean-Louis Dubuit, 60, Rue Vitruve, 75020 Paris, France

Filed Feb. 14, 1978, Ser. No. 877,720
Claims priority, application France, Feb. 18, 1977, 77 04667
Int. Cl.³ G01B *5/20*
U.S. Cl. 34—203 **17 Claims**



1. Apparatus for ultraviolet drying and/or curing solvent free ink on three-dimensional articles, comprising a housing, an endless conveyor arranged at least partly inside said housing and having at longitudinally spaced locations baskets for carrying articles bearing ink to be dried and/or cured, said conveyor having a pathway including, in elevation, at least one bend or loop inside said housing, said bend or loop having an axis of curvature, an elongate ultraviolet lamp disposed proximate to said bend or loop for irradiating a predetermined sector of each article passing over said bend or loop with said sector including a portion of each article being disposed with a respective

basket, means for swivelly mounting said baskets on said conveyor about axes parallel to said axis of curvature, so that as the said baskets pass over said bend or loop the portion of the predetermined sector exposed to said elongate ultraviolet lamp varies and said baskets being of perforate construction with perforate and nonperforate portions arranged so that shadows due to the nonperforate portions continuously move along the predetermined sectors of the articles thereby avoiding constantly obstructed spots in the predetermined sectors.

4,233,755

VEHICLE SIMULATOR OPTICAL PICK-UP HEAD

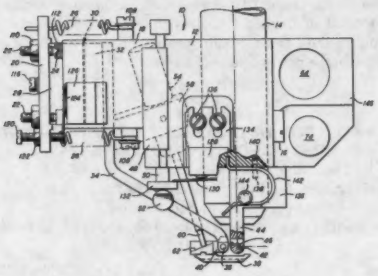
John A. Boniface, Lancing; Ronald E. Field, Brighton; Eric C. Gwynn, Hove, and William L. A. Turner, North Lancing, all of England, assignors to The Singer Company, Binghamton, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,478

Claims priority, application United Kingdom, Feb. 14, 1978, 05879/78

Int. Cl.³ G09B *9/04*

U.S. Cl. 35—11 R **15 Claims**



1. A visual pick-up head for use in a vehicle simulator system having a model board surface and movable camera, including an optical system, for visual image generation, comprising:

(a) a body, including means for mounting said body in a substantially fixed space relation with respect to the camera;

(b) a shoe moveably, adjustably attached to said body and having pivotal freedom of movement about a first, lateral horizontal pitch axis, for contacting the model board surface and traversing said surface as the camera moves;

(c) a mirror attached to said body above said shoe, and pivotable about a horizontal axis, for directing an image to the optical system of the camera;

(d) first sensing means for sensing pitch of said shoe; and

(e) tilt means associated with said first sensing means for rotating said mirror about its pivotal axis.

4,233,756

AIRCRAFT FLIGHT SIMULATING INSTRUMENT TRAINER

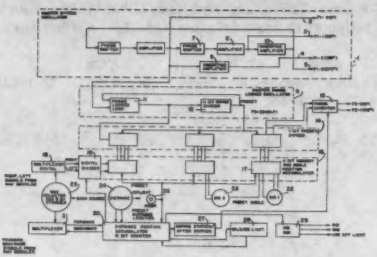
Joshua Horwitz, Magnolia, Mass., assignor to Pacer Systems, Inc., Burlington, Mass.

Filed Dec. 6, 1976, Ser. No. 748,116

Int. Cl.² G09B *9/08*

U.S. Cl. 35—12 F **19 Claims**

17. A simulated aircraft instrument apparatus comprising turbulence signal generator apparatus having a monostable vibrator, first and second counters connected to the monostable vibrator, and first and second digital to analog converters connected to the first and second counters, and first and second



turbulence signal means connected to outputs of the first and second digital analog converters.

4,233,757

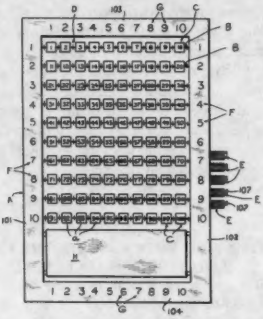
MATHEMATICS DEVICE

Jacqualine Narcise, 1300 Delaware St., Berkeley, Calif. 94702

Filed Sep. 5, 1978, Ser. No. 939,364

Int. Cl.³ G09B *19/02*

U.S. Cl. 35—73 **1 Claim**



1. A mathematical device comprising:

(a) a rectangular frame having two side members and top and bottom members;

(b) ten parallel rods spaced apart and having the ends thereof supported by said frame side members;

(c) ten cubes mounted on each rod and being individually rotatably mounted on the rod, each cube having four peripheral faces with one of the faces on each cube in a row being consecutively numbered from 1 to 10; a second face on each cube in the top row being consecutively numbered from 1 to 10; and the second row consecutively numbered from 11 to 20, and so on to the tenth row which is consecutively numbered from 91 to 100;

(d) a third peripheral face on each cube in the first row being consecutively numbered 1 to 10, and in the second row being numbered in multiples of 2 from 2 to 20, in the third row being numbered in multiples of 3 from 3 to 30, and so on up to the tenth row where each third face of the ten cubes is in multiples of 10 from 10 to 100;

(e) a fourth face on each cube in the first row being consecutively numbered with improper fractions of 1/1; 2/2 and up to 10/1; while the fourth face on the ten cubes in the second row have improper fractions from 2/2 to 20/2 and so on up to the tenth row having improper fractions from 10/10 to 100/10;

(f) the frame side members having numbers from 1 to 10 representing the ten rows of cubes and at least one of the

top and bottom frame members being numbered from 1 to 10 representing ten columns of cubes

(g) a plurality of spacers mounted on each rod with a spacer disposed in fixed position longitudinally of the rod between adjacent cubes on each rod; and

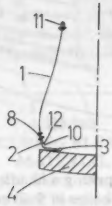
(h) markers removably mounted on said rods and being used in solving various mathematical problems.

4,233,758

FOOTWEAR

Horace Auberry, Waynesville, N.C., assignor to Ro-Search, Inc., Waynesville, N.C.

Filed Feb. 27, 1979, Ser. No. 15,660
Int. Cl.³ A43B 7/06; A43D 21/00
U.S. Cl. 36—3 A **5 Claims**



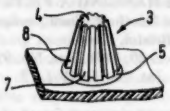
1. Footwear comprising an upper, a tread sole of elastomeric material, said upper being formed of impermeable material and extending downwardly toward but spaced from the upper portion of said sole, a rim of permeable material secured adjacent to the lower margin of said upper and bonded to said sole and having a portion thereof covering at least a portion of said space, said space between the bottom margin of said upper and sole providing ventilation for the footwear through said permeable rim.

4,233,759

OUTSOLES FOR SPORTS SHOES, PARTICULARLY FOR USE ON ARTIFICIAL GRASS

Alfred Bente, Herzogenaurach, Fed. Rep. of Germany; Adolph Dassler, deceased, late of Herzogenaurach, Fed. Rep. of Germany, and by Albert Henkel, legal representative, Düsselford, Fed. Rep. of Germany, assignors to Adidas Sportschuhfabriken Adi Dassler KG, Fed. Rep. of Germany

Filed Apr. 4, 1979, Ser. No. 27,110
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904471
Int. Cl.³ A43B 13/26; A43C 15/00
U.S. Cl. 36—59 R **10 Claims**



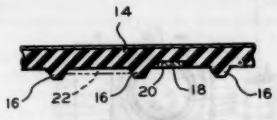
1. An outsole for a sports shoe made from a resiliently deformable material and comprising a multiplicity of deformable frustoconical cleats distributed over the tread side of the outsole and integral therewith, wherein the peripheral surface of the cleats is provided with a multiplicity of axially parallel fine longitudinal ribs and grooves, said ribs and grooves extending over the entire axial length of the cleats.

4,233,760

SHOE WITH REFLECTING MEANS

Joseph E. Haynes, 5945 Merle Dr., Toledo, Ohio 43623

Filed May 29, 1979, Ser. No. 43,059
Int. Cl.³ A43B 23/00
U.S. Cl. 36—137 **7 Claims**



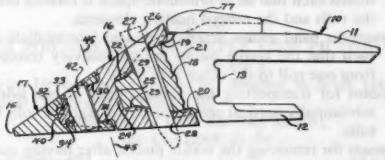
1. In a shoe having an upper and a sole, the improvement comprising: a pluarlity of cavities formed in the bottom surface of the sole and an individual bar of reflective material positioned in each of said cavities and attached to the bottom surface of the sole for reflecting incident light whereby the wearer of the shoe is visible from the front and rear as he travels in the path of a lighted vehicle.

4,233,761

EARTH DIGGING BUCKET TOOTH CONSTRUCTION HAVING A NOSE WITH INCREASED SECTION MODULUS

Robert W. Ryerson, St. Louis, Mo., assignor to Page Engineering Company, Chicago, Ill.

Filed Dec. 1, 1978, Ser. No. 965,904
Int. Cl.³ E02F 9/28
U.S. Cl. 37—142 R **9 Claims**



1. A toothpoint construction for an earth digging bucket, comprising:

a removable toothpoint of abrasion resistant metal having relatively wide diverging upper and lower walls and joining sidewalls together forming a hollow rearwardly open internal socket,

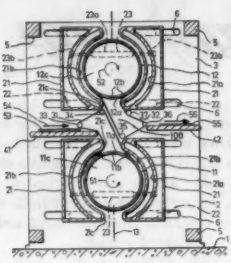
a metal nose for reception of the toothpoint socket, said nose and socket each having complementary upper and lower mounting surfaces, said mounting surfaces being substantially planar and extending laterally across the nose at its base and adjacent its outer extremity both on the top and the bottom of the nose,

and means for increasing the section modulus of the nose against bending failure consisting of semi-circular cross-sectional ribs outstanding from said planar mounting surfaces and extending lengthwise of the nose, one such rib being located at each side of the lengthwise center of the nose and being of the order in size at least one inch in diameter for a five and one-half inch thick nose, said toothpoint socket upper and lower walls having complementary grooves fitting over said ribs.

4,233,762
IRONING MACHINE

Robert Theiler, L'Oree du bois, F-68360 Soultz, France

Filed Jan. 18, 1979, Ser. No. 4,912
Claims priority, application Switzerland, Jan. 24, 1978, 722789/78
Int. Cl.[2] D06F *69/02*
U.S. Cl. 38—8 7 Claims

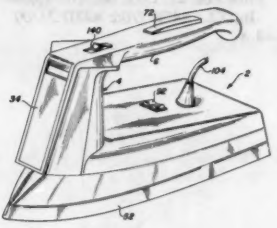


1. An ironing machine for ironing textile pieces comprising:
frame means;
only one pair of rolls arranged above one another at said frame means;
drive means for rotating said rolls in an opposite rotational sense;
heating means for heating the textile pieces;
said heating means possessing for each roll a heating surface serving to heat and iron the textile pieces;
each said heating surface possessing in cross-section a substantially arcuate-shaped configuration;
each of said rolls having a roll axis;
said arcuate-shaped heating surfaces, when said heating means assume a work position, extending at least approximately coaxially with respect to the roll axis of the related roll;
said rolls which are arranged above one another and the related heating means for each said roll being dispositioned such that an intermediate space is formed between the rolls and the related heating elements;
transport band means arranged in said intermediate space such that the textile pieces are successively transported from one roll to the other roll;
means for transporting the textile pieces at one side of a substantially vertical central plane through the rolls to the rolls;
means for removing the textile pieces, after having past the rolls, from the other side of the vertical central plane away from the rolls;
said heating means comprising a pair of heating elements for each roll;
said heating elements of each roll being arranged to opposite sides of the related roll with respect to the roll axis;
said transport band means comprising for each roll at least one separate transport band which is trained about a major portion of the circumference of such roll, so that the textile pieces, during operation of the ironing machine, are transported about at least the circumferential region of each roll which is spanned by the related pair of heating elements;
means for guiding and deflecting the transport bands of each of the rolls such that said transport band of one roll has a band portion which is deflected in said intermediate space in the direction of a deflected band portion of the transport band of the other roll; and
said deflected band portions of said transport bands of said two rolls defining therebetween a transport and transfer path for the textile pieces so that said transport bands transfer at said transfer path the textile pieces from one roll, where the textile pieces bear at one face against the heating surface of the heating means of said one roll, to the other roll where the textile pieces bear with their other opposite face against the heating surface of the heating means of the other roll, so that said textile pieces are ironed at both opposite faces thereof.

4,233,763
STEAM IRON WITH LOW TEMPERATURE SOLEPLATE

Alan R. McMullen, North Canton, Ohio, assignor to NESCO Products, Inc., Binghampton, N.Y.

Continuation of Ser. No. 658,266, Feb. 17, 1976, abandoned.
This application Aug. 21, 1978, Ser. No. 935,294
Int. Cl.[2] D06F *75/06, 75/38*
U.S. Cl. 38—77.83 6 Claims



1. A steam iron comprising a handle, a water tank, a heated metal mass including a boiler in fluid communication with said tank, an electrical circuit including a heater for said heated mass, a valve controlling water flow from said tank to said boiler, the improvement comprising:
a plastic soleplate in heat transfer relationship with said heated metal mass and having a pressure surface on its underside,
a thermostat within said electrical circuit for controlling the heat input to said heated metal mass by controlling energization of said heater,
said thermostat being provided with minimum and maximum temperature settings correlated to the thermal conductivity, the melting temperature, the thickness of said plastic soleplate and the heat transfer relationship between said heated metal mass and said soleplate, and said plastic soleplate being of sufficient thickness; such that at the minimum temperature setting said heated mass is maintained at a temperature sufficiently high to boil water entering said boiler, and said pressing surface is maintained at a temperature above the condensation point of steam, and at the maximum temperature setting, the temperature is sufficiently low to prevent damage to said plastic soleplate adjacent said heated metal mass, and said pressing surface of said plastic soleplate is maintained at a temperature below that which would damage low temperature fabrics.

4,233,764
DEVICE FOR HANGING A PICTURE FRAME

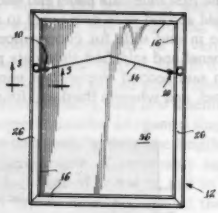
Stuart R. Small, West Hartford, Conn., assignor to The Colonial Spring Company, Bristol, Conn.

Filed Dec. 20, 1978, Ser. No. 971,192
Int. Cl.[3] G09F *1/12*
U.S. Cl. 40—152.1 5 Claims

1. In combination with a picture frame of the type including a U-shaped channel section having a base side and a pair of opposing sidewalls extending away from said base side and terminating in a pair of inwardly turned flanges defining an opening therebetween, a device for hanging said frame on a wall or the like including:
an elongate element having a looped section formed in intermediate portions thereof interposed between said flanges

and said base side of said channel section for retaining said device within the latter,

one extremity of said element including a straight leg therein extending outwardly from said looped section and engaging one of said sidewalls of said channel section whereby



to prevent rotation of said looped portion in one angular direction within said channel section,

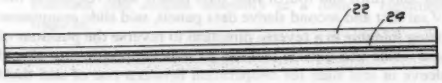
the opposite extremity of said element including means adapted for coupling with structure to hang said frame on said wall.

4,233,765

FRAME FOR SECURING FLEXIBLE SHEETS OF MATERIAL

Norman P. O'Mullan, 412 Essex Ave., Bloomfield, N.J. 07003, and Paul R. T. Hahn, 515 Sherwood Pkwy., Westfield, N.J. 07090

Filed Nov. 22, 1978, Ser. No. 962,989
Int. Cl.[3] G09F *1/12*
U.S. Cl. 40—156 **9 Claims**



1. A frame for securing thin flexible sheets of material comprising:

a support member having a channel in one face, said channel being adapted to receive a thin flexible sheet of material, and

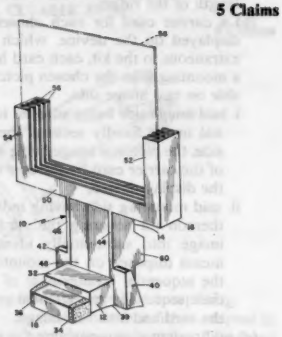
a longitudinal flexible locking member having a thin flat base and a pair of thin angled legs extending outwardly along a central area of said base, the widest dimension across the open ends of said legs being normally engageable with the opening of said channel in a sliding fit, said legs being compressible to reduce said dimension and engage said channel in a press fit when said thin fexible sheet of material is disposed intermediate said support member channel and said locking member to secure said sheet within said channel said support member and channel extend about the periphery of a central open area, said locking member being a flexible strip including said legs extending along said strip and flat surfaces along said base adjacent said legs said flat surfaces being engageable with said support member adjacent said channel, said support member includes a front face and a back face, said channel extending around and into the back face, and a plurality of flexible strips engageable with said channel in said support member to hold said sheet of material tightly across said open area.

4,233,766

TELEPHONE MOUNTING STAND

Duc Doan, 7814 S. San Pedro St., Los Angeles, Calif. 90003

Filed Feb. 6, 1978, Ser. No. 875,392
Int. Cl.[2] G09F *3/20*
U.S. Cl. 40—336 **5 Claims**



1. A display holder comprising:

a base member shaped for defining a plug for fitting into tight fitting frictional engagement with a hand grip socket of a standard desk telephone and including means defining a hand grip with a finger receiving recess for gripping said base for carrying said holder and associated telephone;

a vertically extending support member secured to said base and extending upward therefrom,

a sheet display holding frame secured to the upper end of said vertically extending support member and including at least a slot for receiving and supporting at least one sheet of display material in a substantially vertical plane wherein said vertically extending support member comprises a pair of spaced apart legs, and

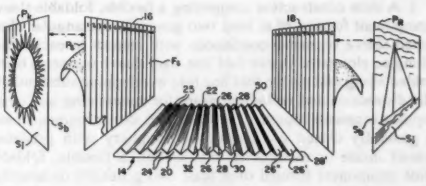
said hand grip extends horizontally between said legs and said recess is co-extensive with the hand grip socket of a standard desk telephone.

4,233,767

KIT FOR MAKING A MULTIPLE VIEW PICTORIAL DISPLAY DEVICE

Dmytro Hryhorczuk, Chicago, Ill., assignor to Artex International Corporation, Chicago, Ill.

Filed Aug. 4, 1978, Ser. No. 930,901
Int. Cl.[3] G09F *19/14*
U.S. Cl. 40—453 **13 Claims**



1. A kit for making a multiple view pictorial display device which enables different pictorial images to be viewed depending upon an appropriate angle of sight of the viewer relative to the frontal plane of the display device and the displacement of the viewer to the left or right of a plane normal to said frontal plane, the kit enabling an unskilled user to choose any pictorial image and adapt said image for mounting on said display device, said kit including:

(a) a mounting board having a surface of corrugation-con-

tour which provides alternately spaced ridges and valleys, spanning the distance between a pair of opposite side edges of the board and entirely across said board, each ridge having a pair of mounting surfaces canted one relative to the other and conjoined at an apex along the entire length of the ridge;

(b) a carrier card for each chosen pictorial image to be displayed on the device, which pictorial image can be extraneous to the kit, each card having an image side and a mounting side, the chosen pictorial image being mountable on said image side,

i. said image side being adapted to have the chosen pictorial image fixedly secured thereon and covering said side, the pictorial image being secured to the image side of the carrier card by the user of the kit on assembly of the display device,

ii. said mounting side having indicia selectively arranged thereon for severing the card and attached pictorial image into substantially identical strips and coding means disposed on the mounting side for maintaining the sequential arrangement of the strips correlated to their sequential arrangement prior to such severing of the card and attached image,

(c) said coding means enabling the strips obtained from one card to be mounted individually on a selected one of the mounting surfaces of a ridge and the strips obtained from the other of said cards to be mounted individually on the second mounting surface with the image sides of the resulting strips being exposed,

(d) the resulting orientation of the exposed image sides being selected so that the strips obtained from one card all face in the same direction and the strips obtained from said second card face in the same direction albeit said directions being opposite one relative to the other,

(e) said coding means enabling said strips of the individual cards to be mounted to the board consistent with said desired sequential arrangement thereof when severed such that only the intact image of one card is visible to a viewer displaced to the left and the intact image of the other card is visible to a viewer displaced to the right of said normal plane and at the appropriate angle of sight in each instance such that different pictorial images are viewable at the discretion of the viewer, the coding means disposed on the mounting side of the strips not being visible to said viewer.

4,233,768

SLIDE CALCULATOR

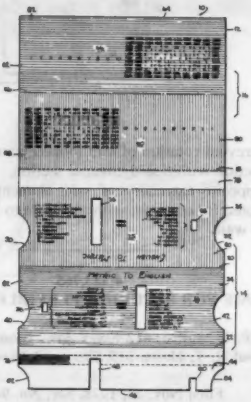
Howard M. Bromberg, P.O. Box 316 Kingsbridge Station, New York, N.Y. 10463

Division of Ser. No. 701,082, Jun. 30, 1976, Pat. No. 4,132,348. This application Sep. 21, 1978, Ser. No. 944,273

Int. Cl.³ G09F *11/00*

U.S. Cl. 40—489 **10 Claims**

1. A slide construction comprising a flexible, foldable sleeve component formed of at least two generally rectangular elongated sleeve segments continuous with respect to each other along an elongated sleeve fold line, said sleeve segments being folded along said sleeve fold line into overlapping substantially flat disposition and including means for maintaining said overlapping segments together such that said sleeve segments have a generally closed cross-sectional periphery with predetermined inside cross-sectional dimensions, a flexible, foldable slide component formed of at least two generally rectangular elongated slide segments continuous with respect to each other along an elongated slide fold line, said slide segments being folded along said slide fold line to place said slide segments into overlapping substantially flat disposition wherein said overlapped slide segments have predetermined outside cross-sectional dimensions less than the corresponding inside cross-sectional dimensions of said sleeve component to permit accommodation of said folded slide component in said folded sleeve component, wherein said elongated slide fold line is parallel to said elongated sleeve fold line, for relative slidable movement between said components and wherein first and second sleeve data panels are provided on respective first and second outside surfaces of said two sleeve segments and first and second slide data panels are provided on respective first and second outside surfaces of said two folded slide segments, said slide construction further including means for matching said first sleeve data panel with said first slide data panel and said second sleeve data panel with said second slide data panel to indicate positioning of said sleeve in said slide for cooperation between said first sleeve data panel and said first slide data panel, and cooperation between said second sleeve data panel and said second slide data panel, and wherein third and fourth slide data panels



are provided on respective first and second inside surfaces of said two folded slide segments, said matching means being provided on said third and fourth slide data panels for matching said third and fourth slide data panels with respective one of sai first and second sleeve data panels, said slide component being foldable in a reverse direction to reverse the positions of said inside and outside surfaces to indicate positioning of said sleeve in said slide for cooperation between one of said third and fourth slide data panels with one of said first and second sleeve data panels, and cooperation between the other of said third and fourth slide data panels with the other of said first and second sleeve data panels.

4,233,769

REAL ESTATE SIGN SUPPORT

Richard L. Archer, 14100 Chadron, Hawthorne, Calif. 90250

Filed Dec. 4, 1978, Ser. No. 966,083

Int. Cl.³ G09F *7/20*

U.S. Cl. 40—607 **1 Claim**

1. A realtor's sign assembly capable of being carried in a dismantled condition from location to location, and erected at a desired location without the use of tools, said sign assembly including:

a. a sign in the form of a stiff rectangular sheet having first and second sides, and a message for the public imprinted on said first side;

b. an elongate rigid upright of transverse L-shaped cross-section, defined by first and second normally disposed legs, said upright having a pointed end, a foot peg that projects outwardly from said upright adjacent said pointed end, and said foot peg when a downward force is applied thereto forcing the portion of said upright adjacent thereto downwardly into the ground, with said upright being removably supported in a vertical position from the ground as a result thereof, said first leg having a plurality of longitudinally spaced slots therein;

c. a first sign support assembly, said first assembly including a first rigid transverse member of channel shape transverse cross section of substantially the same length as said sign, said first member capable of removably supporting the lower longitudinal edge of said sign, and an elongate tab secured to said first member and spaced therefrom, said tab capable of being selectively and removably inserted in one of said slots to maintain said first assembly at a desired elevation on said upright;

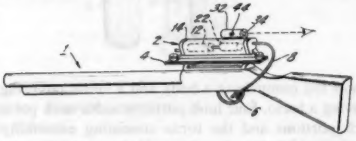
d. a second sign support assembly, said second assembly including a second rigid transverse member of channel shaped cross-section that is capable of removably gripping the upper longitudinal edge of said sign, first means secured to said second, said first means frictionally gripping the upper portion of said upright, with said second assembly gripping the upper longitudinal edge of said sign when said first assembly engages the lower longitudinal edge of said sign, and said first and second assemblies cooperating to hold said sign at a desired elevation on said upright, and said first means including a downwardly extending pocket capable of receiving and removably supporting a lower end portion of an elongate rigid member that has a flag secured thereto, said first means includes a strip of resilient metal secured to said first member and defining a hoop, with said hoop at least partially defining said pocket, and portions of said hoop frictionally engaging said upright to maintain said second assembly at a desired elevation thereon.

4,233,770

LASER AIMING DEVICE FOR WEAPONS

Gerald de Filippis, 10, Avenue Vulliemin, and Jean M. Henry, 20 bis, Montagibert Ave.,, both of 1005 Lausanne, Switzerland

Filed Oct. 23, 1978, Ser. No. 953,585
Int. Cl.³ F41G *1/36*
U.S. Cl. 42—1 A **12 Claims**



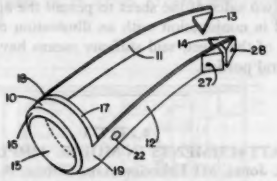
1. A weapon aiming device comprising, a monochromatic light source, means for directing monochromatic light emitted by said light source in an aiming direction, means for activating said light source and being connected to said light source, and means for viewing a target area illuminated by the emitted light comprising a light filter which permits passage therethrough of light of the same wavelength as the emitted light within tolerance limits.

4,233,771

BAIT HOLDER

John G. S. Robinson, Box 26, Sooke, British Columbia, Canada (V0S 1N0)

Filed May 7, 1979, Ser. No. 36,445
Int. Cl.³ A01K *83/06*
U.S. Cl. 43—41 **4 Claims**



1. A holder for holding minnow-type bait comprising:

(a) a ring within which the head of the bait fish is adapted to have a wedged fit so as to expose a portion of the head extending forwardly from near the eyes of the fish,

(b) a pair of elongated arms extending in substantial parallelism from the ring normally in engagement along opposite sides of the body of the bait fish,

(c) hook means at the ends of the arms for piercing the body of the bait fish for maintaining the head of the fish within the ring,

(d) means on at least one of the arms for securing the holder to a fishing line, said means for securing including a passage extending laterally through one of the arms adjacent the ring through which the fishing line can be threaded after passing through the ring and passage means near the trailing end of said one arm though which the fishing line can then be threaded for maintaining said one arm in substantial parallelism with the line, so the line is offset relative to the fore and aft axis of the bait fish and the bait fish moves in a rolling and side to side action when the holder is pulled through the water.

4,233,772

ANIMATED ILLUSTRATION FOR BOOKS AND THE LIKE

Douglas A. Hamar, 0236 SW. Palatine Hill Rd., Portland, Oreg. 97219

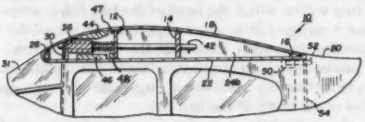
Filed Mar. 15, 1979, Ser. No. 20,757
Int. Cl.³ A63H *33/38*
U.S. Cl. 46—35 **2 Claims**

1. In combination,

a sheet having a printed illustration thereon and defining an open area,

a pliable appendage secured to said sheet in overlying relationship to the open area and contributing visually to the illustration, said appendage including stiffener means to facilitate manipulation of said appendage, said open area being of sufficient size to permit manipulation of said appendage by insertion of fingers of the user through said open area into said appendage, said appendage and stiffener means displaceable through the open area to either of the two sides of the sheet to permit the appendage to be used in conjunction with an illustration on the opposite side of the sheet, said stiffener means having a bendable central portion.

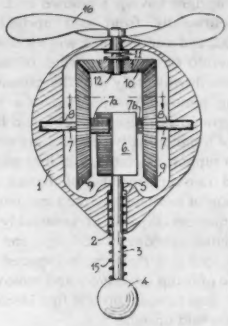
4,233,773
ATTACHMENTS IN MODEL AIRPLANES
Robert S. Jones, 311 Lakeview Ave., Clifton, N.J. 07011
Filed Oct. 17, 1978, Ser. No. 952,114
Int. Cl.³ A63H *24/02*
U.S. Cl. 46—76 R **9 Claims**



1. A combination including biased attaching means for selectively mounting a component to the fuselage of a model aircraft, said attaching means including: (a) at least one forwardly extending projection carried by and in the to-be-removably attached component; (b) a receiving hole for said projection of selected size and position, said hole formed in a forward bulkhead portion of the fuselage; (c) a bias means cooperatively associated with said forward bulkhead portion and projection and adapted to permit a limited forward movement of the to-be-attached component against the resistance of the bias means; (d) at least one rearwardly extending projection fixedly secured to the to-be-removably attached component, said rearwardly extending projection being fixed in an abutting stop, and (e) a receiving hole of selected size and position formed in a rear bulkhead portion of the fuselage and adapted to slidably retain this rear projection whereby when the forwardly extending projection is brought to the receiving hole in the forward bulkhead and the to-be-attached component is moved forwardly against the bias means, forward movement is sufficient for the end of the rearwardly extending projection to be brought in way of the receiving hole in the rear bulkhead portion whereby a rearward movement with the assistance of the bias means may be made and the abutting stop brought to and against the rear bulkhead to mount the component by the front and rear projections.

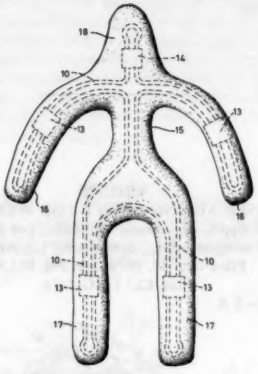
4,233,774
SPINNING TOP
Raphael Sahar, 2 King David St., Tiberias, Israel
Continuation-in-part of Ser. No. 911,177, May 31, 1978, Pat. No. 4,202,133. This application Jun. 26, 1979, Ser. No. 52,111
Int. Cl.³ A63H *27/00*
U.S. Cl. 46—82 **3 Claims**

1. A spinning top comprising a hollow body having an inwardly extending bore in which slides a shaft the innermost end of which carries co-directional with the shaft a Z-profiled member, the sidewardly extending portions of the said Z-profiled member being in frictional contact with two oppositely disposed, co-directional axles seated rotationally in the wall of the said hollow body, a crown wheel being fixedly keyed on each of the said axles, both said crown wheels meshing with a pinion, an axle extending from the pinion and being connected therewith for transmission of rotational movement



in one direction only, a propeller being fixed to the outer end of the said axle.

4,233,775
SOFT TOYS
Anthony C. Neufeld, London, England, assignor to Newfeld Limited, Ashford, England
Filed Nov. 29, 1978, Ser. No. 964,518
Int. Cl.³ A63H *3/04*
U.S. Cl. 46—151 **10 Claims**



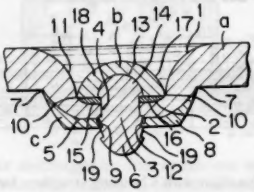
1. A soft toy comprising a body and a fabric covering, said body having a torso, four limb portions and a neck portion all of which portions and the torso consisting essentially of a foamed rubber latex material moulded over a flexible wire skeleton which skeleton is formed from a single length of annealed wire covered with a plastics material, and said fabric covering is permanently fitted over said body and includes hand and foot members at the respective ends of said limb portions and a shaped head member which fits over said neck portion, the hand, foot and head members being stuffed with a stuffing material whereby the hand, foot and head members hold a desired, pre-formed shape dictated by the fabric covering.

4,233,776

ARTIFICIAL EYE STRUCTURE FOR USE IN A DOLL

Kenichi Suzuki, Koshigaya, Japan, assignor to Suzusei Co., Ltd., Saitama, Japan

Filed Jun. 6, 1978, Ser. No. 913,036
Claims priority, application Japan, Mar. 3, 1978, 53-23636
Int. Cl.³ A63H *3/38*
U.S. Cl. 46—165 **7 Claims**



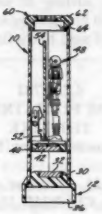
1. An artifical eye structure comprising:
an eye piece including:
an elongated stem, the front end of which is visible as the pupil of the eye,
a washer carried by said stem, said washer having an outer diameter larger than the diameter of the stem whereby the front surface of said washer is visible as the iris of the eye, and
a covering member for the front end of said stem and the front surface of said washer, said pupil and said iris being visible through said covering member; and
retaining means for receiving and retaining the back end of said stem whereby said retaining means can be located behind a face material and said washer in front thereof to retain the eye in the face material.

4,233,777

FLOATING DOLL, TOY ASSEMBLY

Tsutomu Inoue, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1979, Ser. No. 10,532
Int. Cl.³ A63H *33/26*
U.S. Cl. 46—238 **17 Claims**



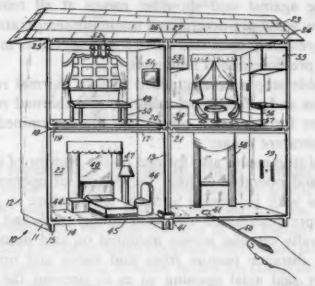
1. A toy assembly comprising:
a container;
a base member mounted to the container and including a first permanent magnet;
a floating base member contained in the container;
a toy figure contained in the container and mounted to the floating base member, the floating base member including a second permanent magnet, the first and second permanent magnets being disposed to repel one another whereby the toy figure is suspended in the container to simulate a floating effect, and
a transparent panel member removably mounted to the floating base member, the panel member being dimensioned to prevent rotation of the toy figure within the container.

4,233,778

MODULAR TOY

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Jul. 19, 1978, Ser. No. 926,135
Int. Cl.³ A63H *33/26, 33/06, 33/04;* G09F *19/00*
U.S. Cl. 46—240 **5 Claims**



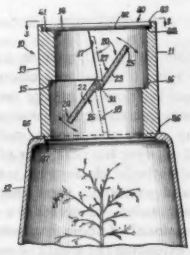
1. An assembly toy comprising in combination:
a plurality of containers defining respective room modules and each having side wall portions joined by a bottom wall defining a floor,
said modules being assembled in stacked relationship one above the other with the lower of the two stacked modules having a ceiling spaced a distance below the floor of the upper module providing a free space therebetween,
a magnet disposed within said free space and a manipulator for said magnet operable from the exterior of the assembly to permit the magnet to be shifted to different locations beneath the floor of the upper module, and
a device to be moved across the floor of the upper module including a permanent magnet in the base of said device, said base of said device being disposed on the upper surface of said upper module floor to permit the device to be moved across said floor by the manipulative movement of said magnet within said free space.

4,233,779

AUTOMATIC ENVIRONMENT STABILIZER AND PROTECTION DEVICE FOR PLANTS

Jerry Griffith, 1038 Westgate Dr., Charleston, Ill. 61920

Filed Feb. 14, 1979, Ser. No. 11,790
Int. Cl.³ A01G *13/04, 9/24*
U.S. Cl. 47—26 **5 Claims**



1. A protective device comprising:
a portable insulated plant cover having a circular opening in its top, and
a generally cylindrical housing of thermal insulating material formed with an axial opening therethrough and said hous-

ing being adapted to mount in the circular opening in the top of the plant cover;

a generally flat circular valve of thermal insulating material mounted within said axial opening and disposed to turn about a horizontal diametric axis within said housing;

semicircular shoulder means formed on the interior of said housing adjacent said valve and adapted to abut against same so as to form a thermal seal with said valve;

thermal responsive means attached to said valve and responsive to ambient temperature and operable to close said valve against said shoulder means at all temperatures below some pre-determined minimum temperature and to progressively open said valve for temperature in excess of said pre-determined minimum;

adjustable stop means attached to said thermal responsive means and effective to calibrate said thermal responsive means for operation over some pre-determined ambient temperature range;

vertical stop means also formed on the interior of said housing and operable to limit the degree of opening of said valve with increasing ambient temperature in excess of said pre-determined minimum temperature; and

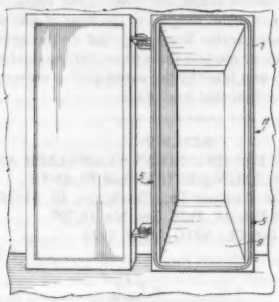
a generally circular screen mounted on said housing at an axial distance remote from said valve and operable to cover said axial opening so as to prevent the entry of insects, pollen and dust into the plant cover.

4,233,780

DOOR SEAL

John H. Royce, Woodbridge; John E. Rowarth, Markham, and John Walker, Scarborough, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Feb. 9, 1979, Ser. No. 10,755
Int. Cl.[3] E06B *7/16*
U.S. Cl. 49—485 **4 Claims**



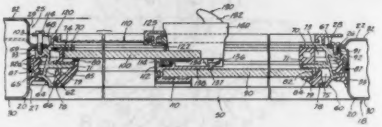
1. A gasket assembly for providing an air-tight seal between a door and a door-frame of a vacuum chamber, or the like, wherein the door and the door-frame are warped to varying degrees due to stresses caused by high internal pressure, said assembly comprising a retaining means including a groove extending about and adjacent the perimeter of the door-frame, and a bead of a resilient solid elastomeric material, said bead being retained in and extending somewhat proud of said groove, said retaining means comprising a strip of a solid elastomeric gasket material of shore hardness of about 70, a longitudinal groove extending the length of said strip material, and said bead of a solid resilient elastomeric material comprising about 70–80%/w of a silicone rubber curable at room temperature and about 30–20%/w of sodium silicate in the form of microspheres, said elastomeric material having a shore hardness of about 30 to 45 and tensile strength of 280 to 328 psi, said strip of solid elastomeric gasket material and said bead cooperating to create an air-tight seal when said door is closed against said door-frame.

4,233,781

WINDOW ASSEMBLY FOR SOCKET WINDOW

Norman E. Roe, Sierra Madre, Calif., assignor to Hehr International, Inc., Los Angeles, Calif.

Filed Apr. 11, 1978, Ser. No. 895,384
Int. Cl.[2] E06B *1/04*
U.S. Cl. 49—504 **5 Claims**



1. In combination with a housing structure having a window opening formed in a wall thereof with a body flange projecting inwardly toward the central portion of the window opening and forming a socket having a wall surface between said body flange and the external surface of the structure,

a window frame having a peripheral web,

said frame being provided with an interior flange and an exterior flange extending inwardly from said web toward the central portion of said window opening,

said web and said inwardly extending flanges being arranged to support window panel structure within said frame,

said frame also being provided with an interior flange and an exterior flange extending outwardly from said web away from said central portion of said window opening,

said frame having an interior flange section comprising said two interior flanges and an exterior flange section comprising said two exterior flanges,

means securing said interior flange section of said frame directly to said body flange;

means securing window panel structure on said frame and supporting said window panel structure on the exterior side of said body flange; and sealing means extending outwardly from the outer side of said web into engagement with said socket surface for sealing the space between said window frame and said socket surface;

the interior surface of said inwardly extending interior flange being offset toward the interior of said structure from the interior surface of said outwardly extending interior flange and being substantially coplanar with the interior surface of said body flange.

4,233,782

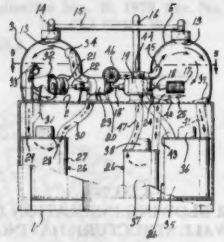
WORK CABINET FOR PODIATRISTS, DENTIST AND THE LIKE

Ronald Perrault, 3 Avenue des Sapins, Notre-Dame des Prairies, Canada (J6E 1C3)

Filed Jun. 21, 1979, Ser. No. 50,783
Int. Cl.[3] B24B *55/06*
U.S. Cl. 51—5 R **6 Claims**

1. work cabinet for machining, grinding, buffing and polishing small work pieces, such as dental models, foot protheses, foot-correcting inner soles and the like, said work cabinet comprising a housing having a work space to receive a work piece and having a front opening providing working access to said work piece, a power-driven working tool located in said working space, a light source exposed in said working space and mounted within the top portion of said housing to illuminate the work piece and the working tool, an air suction mouth opening in said housing adjacent said working tool, air suction means communicating with said air suction mouth, means to filter the air evacuated from said housing by said air suction means, a clean air-discharging nozzle located in said housing and directed towards said light source to create an air stream of

clean air over and around said light source and to prevent deposits of dry and wet dust and grindings on said light source, means to supply clean air under pressure to said nozzle, the



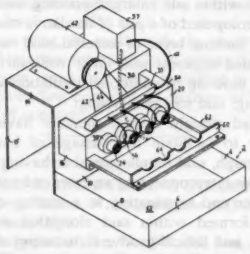
mass flow of air discharged by said nozzle not being greater than the mass flow of air sucked out of said housing by said air suction means, so as not to produce an air over-pressure within said housing.

4,233,783

DEVICE PARTICULARLY USEFUL FOR CUTTING OR GRINDING ROUND GIRDLES OF GEMS

Hanoch Stark, 60 Harishonim St., Ramat Hasharon, Israel, assignor to Hanoch Stark, Ramat Hasharon, Israel

Filed Jan. 26, 1979, Ser. No. 6,999
Int. Cl.³ B24B 9/16
U.S. Cl. 51—73 R **6 Claims**



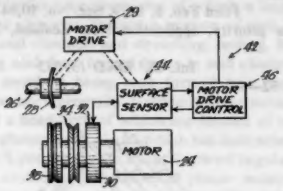
1. A device particularly useful for cutting or grinding the round girdle surfaces of round-cut gems, comprising: a base; a plurality of cutting heads rotatably mounted on said base about spaced horizontal axes arranged in a straight line; each of said cutting heads being formed on face with a cavity having a grinding surface circular in transverse section and having a larger diameter than that of the round surface to be cut; the outer end of the cavity being curved and its grinding surface having abrasive particles fixed thereto; a support extending across said base and spaced forwardly of said cutting heads; said support including holder-supporting means for supporting a gem-holder in alignment with the cavity of each cutting head; a nozzle for each cutting head for supplying a liquid medium to the grinding surface of its cavity; a receptacle underlying all the cutting heads for receiving the liquid medium run-off from the heads; a pump for pumping said liquid back to the nozzles and a drive for rotating each head around the longitudinal axis of its cavity.

4,233,784

LENS EDGING APPARATUS

Wilfredo P. Loreto, Hoffman Estates, Ill., assignor to AIT Industries, Inc., Schaumburg, Ill.

Filed Mar. 12, 1979, Ser. No. 19,767
Int. Cl.³ B24B 9/14
U.S. Cl. 51—105 LG **15 Claims**



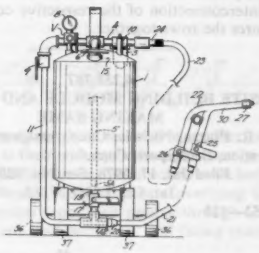
1. In an apparatus for grinding an article, a grinder having a grinding surface; means for supporting the article and for moving the same against said grinding surface; and detector means for detecting the axial position of the highest point on said grinding surface between opposite sides of said surface and means responsive to said detector means for controlling operation of said supporting means to locate the article opposite from and to move the article against said highest point position.

4,233,785

SANDBLASTING APPARATUS

Ralph N. Abeli, 6685 Main St., Springfield, Oreg. 97477

Filed Oct. 13, 1978, Ser. No. 951,153
Int. Cl.³ B24C 5/04, 7/00
U.S. Cl. 51—427 **5 Claims**



1. A sandblasting apparatus comprising,

an upright abrasive storage tank having an outlet at its lower end,

a vibratory conduit supported in a free standing manner by the tank upper end and extending substantially the length of the tank and in communication with a source of air pressure and having its discharge end proximate the tank outlet whereby abrasive particles within the tank are put into a fluid state by inherent operational conduit vibration prior to outward passage through said outlet,

mixing means receiving a carrier flow of pressurized air and the fluidized particles discharged from the tank outlet, and

a sandblasting gun in communication with said mixing means receiving the fluidized flow of abrasive particles and the carrier air flow, an air hose in communication with a source of air pressure, said gun served by said air hose and receiving a flow of pressurized air for mergence with and propelling of the fluidized abrasive, said sandblasting gun further including a nozzle having a liner, a sleeve disposed concentric about said liner, a housing disposed outwardly of said sleeve, a mass of solder disposed interiorly within said housing serving to permanently join nozzle liner,

sleeve and housing and to provide a conical transition surface extending intermediate the housing and the liner.

4,233,786

ROOF TILE EDGE COVER

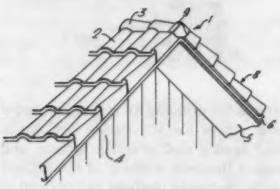
Allan B. Hildreth, 78 Marine Parade, Paraparaumu, New Zealand

Filed Feb. 8, 1979, Ser. No. 10,841

Claims priority, application New Zealand, Feb. 16, 1978, 186496

Int. Cl.³ E04D *13/035*

U.S. Cl. 52—94 **5 Claims**



1. A roof tile edge cover assembly comprising a roof tile edge cover having an elongate web of diminishing width along its length said web having along both edges thereof an inwardly directed lip, said lips defining a large and a small opening at respective first and second ends of said web, a rail assembly to the roof edge, and wherein the large opening at the first end of one of said covers is slid over the edge of an end tile of one row and over the second end of a cover already in position over the edge of an end tile of the adjacent lower row with the inwardly directed lips of the covers engaged respectively along the respective tile edges and the downturned lip of the rail assembly such that the covers are secured to the roof edge and the interconnection of the respective covers of adjacent rows secures the rows together.

4,233,787

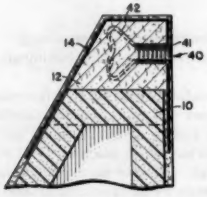
COMPOSITE BUILDING MODULE AND METHOD FOR MAKING SAME

Matthew R. Piazza, Nichols, Conn., assignor to Maso Therm Corporation, Bridgeport, Conn.

Filed Jul. 17, 1978, Ser. No. 925,251

Int. Cl.³ E04G *21/12*

U.S. Cl. 52—125 **21 Claims**



1. A method for making composite building modules comprising:

a. forming a bottom layer of fiber reinforced wet cementitious material;

b. forming a core by placing at least two rigid hollow foam box members each comprising a hollow tubular central portion and two flat end covers connected thereto side-by-side in a single layer on the bottom layer with all the adjoining edges forming at least one continuous channel completely around the core solely at the exterior thereof; and

c. encapsulating the core in a fiber reinforced wet cementitious shell by depositing fibers and cementitious material around the sides of the core members and on the top thereof, filling each channel forming a rib completely around the interior of the cementitious shell.

4,233,788

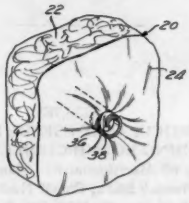
TOOL FOR BLOWING INSULATION INTO AN EXISTING WALL STRUCTURE HAVING A BRICK EXTERIOR

Dale L. Clifft, Tarzana, Calif., assignor to LCG, Inc., Indio, Calif.

Filed Jun. 25, 1979, Ser. No. 51,613

Int. Cl.³ E04G *21/00*

U.S. Cl. 52—127 **5 Claims**



1. In combination with an existing wall structure being formed of an inner wall surface and an outer wall surface with there being an enlarged opening therebetween, a layer of insulation located within said enlarged opening, said layer of insulation being composed of a pad of insulative material which is secured to a backing layer of material, said backing layer of material located adjacent said inner wall surface, a tool to facilitate the blowing of additional insulation within said enlarged opening, said tool comprising:

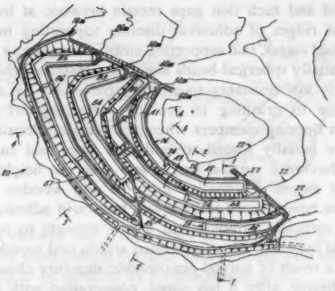
an elongated straight tubular member having an internal chamber to facilitate the passage of blown insulation therethrough, said tubular member having a longitudinal center axis interconnecting an inner end and an outer end, said outer end terminating in a cutting edge, a helical groove formed within said elongated straight tubular member, said helical groove terminating at its outermost end at said cutting edge, an access opening being provided through said outer wall connecting with said internal enlarged opening, said outer end of said tool to be inserted through said access opening and to be moved to cut through said pad of insulation into contact with said backing layer of material, upon rotating of said tool about said longitudinal center axis said cutting edge cuts through said backing layer of material and further rotation of said tool results in said backing layer of material to be located within said helical groove and spaced from said inner wall surface, whereupon the portion of said backing layer of material that is now located within said elongated tubular member is to be cut through to permit conducting of insulation through said elongated tubular member and be deposited between said backing layer of material and said inner wall thereby compressing said pad of insulation thereby permitting a substantial higher quality and greater amount of insulation to be supplied within said enlarged opening.

4,233,789

STORAGE TANKS

Carlo Dinardo, "Teighness", Main St., Killearn, Stirlingshire, England

Continuation of Ser. No. 788,934, Apr. 19, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,701
Int. Cl.[2] E02D 27/38
U.S. Cl. 52—169.2 9 Claims



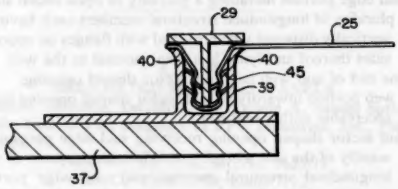
8. A method of manufacturing a tank farm comprising designating on a map of the terrain in which the tank farm is to be located, elongate strips of ground surface located at different predetermined levels of said terrain, the longitudinal axis of each of which strips, when taken in plan view, substantially conforms to a contour line of the map, forming tank sites in the terrain in the form of shallow trenches corresponding to the location of said strips, constructing on each of said tank sites an elongate, closed tank having its longitudinal axis substantially horizontal, its vertical dimension being substantially the same as the depth of the trench, wherein a plurality of the closed tanks at one of said levels of the terrain are disposed substantially end to end and separated from one another and wherein the longitudinal axis of at least one of said closed tanks is curvilinear when taken in plan view so as to substantially conform to a curvilinear portion of the contour line at the predetermined level at which said one closed tank is constructed, and covering the tanks with the earthworks excavated from said trenches substantially to restore the contour of the natural terrain, each said tank including a plurality of longitudinally-extending containment barriers at least one of which is made of concrete.

4,233,790

EXTRUSIONS AND BUILDING STRUCTURES

David F. Meadows, Milton, W. Va., assignor to DoNel Corporation, Mt. Vernon, Ohio

Continuation-in-part of Ser. No. 807,492, Jun. 17, 1977, abandoned. This application Jan. 8, 1979, Ser. No. 1,593
Int. Cl.[3] A47H 13/00
U.S. Cl. 52—222 1 Claim



1. A window-like structure comprising:

a plurality of rigid side and end members secured together in perpendicular and parallel relationship to form a frame and arranged to be secured to a building structure, the ends of said members being mitered and united together, each of said members of said frame being formed with channels which combine to form a channel positioned around the periphery of said frame, said channel including teeth projecting inwardly from its sides;

a sheet of flexible plastic material spreading over all of said side and end members;

a plurality of locking members, one of which is inserted in each of said channels, forcing a portion of said flexible sheet into said channels and stretching, sealing, holding, and locking said sheet to said frame in said channels;

said locking members being each formed as a one piece extrusion having a generally T-shape in cross section with a stem and a head both of which are formed of substantially rigid plastic material and which has both sides of the stem of the T provided with integral spaced angularly and outwardly extending projections of plastic material substantially more flexible than the substantially rigid material of the main section of the T and integrally united with the substantially rigid material of the main section of the T, said projections having a thickness less than the stem and being inclined from the stem toward the head;

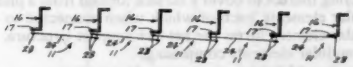
the width of the channel between the crests of the teeth being less than the width between the outer ends of the projections, the teeth and projections combining to lock the sheet in place.

4,233,791

VAPOR IMPERMEABLE INSULATION FACING CONSTRUCTION

LeRoy L. Kuhl, 1101 - 31st St., West Des Moines, Iowa 50265, and Lester L. Thompson, P.O. Box 603, Montezuma, Iowa 50171

Filed Feb. 9, 1979, Ser. No. 10,713
Int. Cl.[3] E04B 1/74, 7/00
U.S. Cl. 52—309.1 12 Claims



1. In a roof structure which includes a number of ceiling purlins supported at their ends by horizontal beams, a continuous vapor impermeable facing construction attached to said purlins and said beams which supports overlying layers of insulation and prevents vapor from passing through said facing construction and into said insulation, said facing construction comprising:

a facing material, wherein said facing material is both vapor impermeable and sufficiently strong to support the weight of overlying insulation, said facing material being formed into a number of rectangular sheets, each of said rectangular sheets being suitable in width to extend between an adjacent and parallel pair of said purlins, and suitable in length to extend from one end of said purlins to the other, said rectangular facing sheets being joined together at said purlins to cover the ceiling area spanned by said purlins;

a number of reinforcing members attached to said facing sheets along the portions where said facing sheets are attached to said purlins, and also along the portions where said facing sheets are attached to said beams, each of said rectangular facing sheets having a pair of longer sides and a pair of shorter ends, one of said reinforcing members being attached along each of the sides and each of the ends of each of said rectangular facing sheets; and

permanent fastening means, wherein said permanent fastening means attach said rectangular facing sheets, through said reinforcing members, to said purlins and said beams, each of said purlins having a lower flange such as is included in a C or a Z type purlin, and wherein when an adjacent pair of said purlins are viewed together, each of

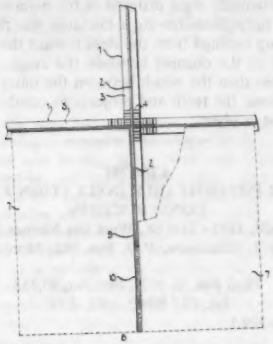
the bottom sides of the lower flanges of said pair of purlins has an outer portion, said rectangular facing sheets being attached to the outer portions of the bottom sides of the lower flanges of said purlins to permit said rectangular facing sheets to overlap when connected to a common purlin to create an overlapping facing joint, said overlapping facing joint being impervious to vapor, and thus, preventing vapor from passing through said overlapping facing joint.

4,233,792

PROCESS FOR THE LAYING OF A FLOOR, AND FOR A TILE CLOTHING, AND ELEMENTS FOR THE REALIZATION THEREOF

Alberto Malavasi, Piazza Citta Leonina, 9, 00193 Rome, Italy

Filed Dec. 26, 1978, Ser. No. 973,389
Int. Cl.[2] E04F *13/08*
U.S. Cl. 52—387 **9 Claims**



1. A net-like support structure for use with tiles to facilitate the laying thereof to cover a surface formed from a plurality of modular elements, each of which when connected to another modular element forms the net-like support structure, each of said modular elements comprising:

a horizontal listel;

a vertical band connected with said horizontal listel to form therewith an inverted T-shaped member to hold the tiles in place, said vertical band forming a spacer between adjacent tiles;

said horizontal listel including upper surfaces on both sides of said vertical band to form a stop for the edge of the lower surface of the tiles; and,

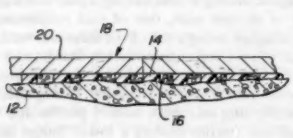
projecting resting means on said horizontal listel upper surface adapted to receive a material which is also used to hold the tiles to the surface to be covered.

4,233,793

RESILIENTLY CUSHIONED ADHESIVE-APPLIED WOOD FLOORING SYSTEM AND METHOD OF MAKING THE SAME

Ray E. Omholt, 590 Grove Rd., Thorofare, N.J. 08086

Continuation-in-part of Ser. No. 339,496, Mar. 8, 1973, Pat. No. 3,893,275. This application Jul. 7, 1975, Ser. No. 593,607
Int. Cl.[2] E04F *13/00*
U.S. Cl. 52—390 **9 Claims**



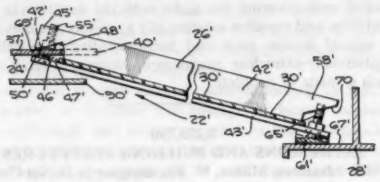
1. A restricted-growth resiliently cushioned bridging adhesive-applied wood flooring system comprising a support base and wooden flooring members, uncured elastomeric adhesive spread upon at least one of said support base and said wooden flooring members in spaced ridges, adjacent ridges each having substantially uniform height, at least some of said ridges being spaced a substantial distance from an adjacent ridge, said wooden flooring members being forced toward said base so that an intimate bond of said adhesive ridges with both the base and the bottom faces of the wooden flooring members will be achieved and such that gaps remain between at least some adjacent ridges of adhesive; discrete supporting means between said ridges, said supporting means comprising a plurality of essentially spherical beads made of a material which has a relatively low resistance to crushing but which has sufficient resistance to crushing to provide initial support for said wooden flooring members when said wooden flooring members are initially forced toward said base, said supporting means having a vertical height less than the height of said uncured ridges of adhesive prior to said wooden flooring members being forced toward said base, said adhesive ridges having sufficient gripping and tensile strength to overcome potential buckling forces generated within said wooden members as a result of normal atmospheric moisture changes, and said adhesive, after it has cured, cooperating with the gaps between adjacent ridges of cured adhesive to provide resilient cushioning for said flooring system.

4,233,794

ADJUSTABLE CONNECTING MEANS FOR CEILING CONSTRUCTIONS AND THE LIKE

Ben Mayer, Los Angeles, Calif., assignor to Envel Corporation, Los Angeles, Calif.

Filed Dec. 18, 1978, Ser. No. 970,274
Int. Cl.[3] E04B *5/52, 1/343*
U.S. Cl. 52—484 **7 Claims**



1. A connecting means for structural members of a suspended ceiling construction which is supported at least at its periphery and its center, comprising in combination:

a central support member having an edge portion,

said edge portion including a plurality of open ended slots;

a plurality of longitudinal structural members each having a vertically disposed web provided with flanges on opposite sides thereof and lying in a plane normal to the web,

one end of said web having a sector shaped opening;

a web portion inwardly of said sector shaped opening being receivable within said slot,

said sector shaped opening receiving said edge portion inwardly of the slot whereby such interengagement of said longitudinal structural member and said edge portion restricts relative lateral movement, relative longitudinal movement in one direction, and permits relative movement in a vertical direction of said support member and structural member;

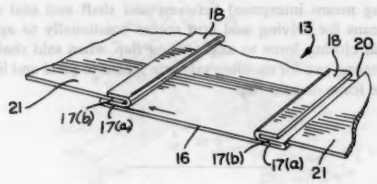
and means securing said edge portion to said flanges in a selected relation.

4,233,795

FIELD REPAIR ROOF PANEL FOR A RAILWAY CAR

Richard C. Snyder, Michigan City, Ind., and Donald C. Bodinger, Pelham, Ala., assignors to Pullman Incorporated, Chicago, Ill.

Filed Nov. 6, 1978, Ser. No. 958,084
Int. Cl.[3] E04G 23/02; B61D 17/12
U.S. Cl. 52—514 8 Claims



1. In a railway car a roof sheet provided with a pair of spaced roof sheet margin portions each defining with the other an opening to be covered by a replacement panel,

said replacement panel comprising

a sheet of material having an end flange with an outer free edge and an end flange unit generally parallel to and defining with the flange an outwardly opening slot and receiving a respective margin portion of the roof sheet, said slot having an open end at said free edge,

said end flange unit having a pair of substantially contiguous generally parallel flange sections that are generally parallel to the flange, one of said flange sections forming a part of said slot and being between the other flange section of the flange,

a first nose portion being a curved portion connecting the flange with the one flange section and forming a closed terminus of the slot,

said central portion connecting with said other flange sections and said first nose portion overlying said central portion,

a second nose portion being a curve portion connecting the one flange section with the other flange section and extending outwardly of the outer edge of the flange in the opposite direction of said first nose portion and forming the outer end part of the end portion,

welding means securing each of said outer end portions to said each of said roof margin portions, and

each of said outer end part of each said second nose portion extending outwardly of said end outer edge of the flanges providing a welding support and roof margin guide adjacent the outer edge of each flange for attachment of a respective roof sheet margin portion to each flanged outer end portion.

4,233,796

DESICCATED SPANDREL PANELS

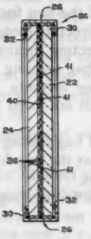
Renato J. Mazzoni, Tarentum, and Vernon A. Shoop, Springdale, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 22, 1978, Ser. No. 963,075
Int. Cl.[3] E04C 2/54; E06B 7/12
U.S. Cl. 52—789 15 Claims

1. A spandrel unit comprising:

a film containing a desiccant;

a pair of panels each having a major surface, the major surface of said panels facing one another with said film between and substantially coextensive with the major surfaces with said desiccant absorbing moisture between the major surfaces; and



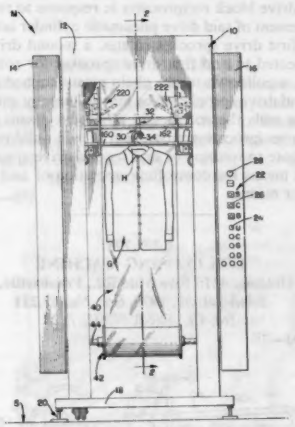
sealant means mounting said panels to provide a moisture-resistant barrier against moisture penetration between the major surfaces of said panels.

4,233,797

AUTOMATIC BAGGING MACHINE

Karl E. Schwarz, 714 Tifft Ave., Horseheads, N.Y. 14845

Filed Apr. 17, 1979, Ser. No. 30,947
Int. Cl.[3] B65B 57/04, 43/28
U.S. Cl. 53—66 28 Claims



1. A garment bagging machine comprising:

a cabinet;

material guide means on said cabinet for guiding tubular bag forming material from a bag forming material supply means;

spreader means on said cabinet for spreading the walls of said tubular material apart;

hanger means on said spreader for supporting a garment to be bagged;

pulldown means movably mounted on said cabinet and having material gripping means thereon for gripping the bag forming material so that such bag forming material can be pulled down over a garment supported on said hanger means;

gripping means power means on said pulldown means, and gripping jaw connecting means connecting said gripping means power means to said gripping means;

garment length sensing means on said pulldown means;

bag sealing means mounted on said cabinet for sealing the walls of the tubular bag forming material together, said sealing means including a hot air generating means which

generates air hot enough to melt the bag forming material, hot air directing means on said hot air generating means for directing hot air onto the bag forming material to be sealed, and clamping means on said bag sealing means for clamping the walls of the bag forming material together adjacent said hot air directing means so that hot air issuing from said hot air directing means contacts the clamped together walls of the bag forming material whereby such hot air melts the bag forming material so that such clamped together walls are fused together thereby forming a seal on a bag;

bag cutoff means on said bag sealing means for cutting off a length of material from the bag forming material guided from the supply means;

main drive power means for moving said pulldown means, said main drive power means including a drive pneumatic cylinder;

said pneumatic cylinder including an actuating rod and connecting means connecting said pneumatic cylinder actuating rod to said drive means with said connecting means including a drive block slidably mounted on said cabinet and connected to said actuating rod to be reciprocated thereby, a pulley mounted on said drive block, a sprocket mounted on said drive block, a first rotatable drive sprocket mounted on said cabinet, a cable means trained around said pulley and connected at the end thereof to said cabinet, said cable means translating the linear reciprocating movement of said drive block into rotational movement of said first drive sprocket so that as said drive block reciprocates in response to reciprocating movement of said drive pneumatic cylinder actuating rod, said first drive sprocket rotates, a second drive sprocket connected to said first drive sprocket for rotation therewith, a pulldown means chain means trained around said second drive sprocket to be moved thereby and connected at the ends thereof to said pulldown means for causing linear reciprocating movement of said pulldown means in response to rotation of said second drive sprocket; and

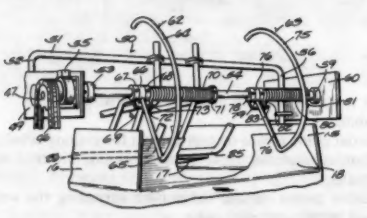
control means for controlling operation of said main drive power means.

4,233,798

BOX CLOSING MACHINE

James R. Helding, 8415 Five Mile Rd., Franksville, Wis. 53126

Filed Jul. 30, 1979, Ser. No. 62,251
Int. Cl.³ B65B *57/02, 7/20*
U.S. Cl. 53—76 **6 Claims**



1. A machine for folding and holding the leading and trailing top end flaps and side flaps of a box over the body of the box, said machine comprising:

power driven conveyor means for conveying a succession of boxes along a predetermined path into and through the machine,

a shaft extending laterally in relation to said path and spaced from said conveyor means,

clutch means having power input means for being continuously driven and power output means operatively coupled to said shaft, said clutch means having operating means operative to couple and uncouple said power input means to and from said output means, respectively,

means responding to a box reaching a predetermined position on said conveyor means by causing said clutch operating means to couple said input to said output means for said shaft to make one revolution and then to uncouple said means,

arm means journaled on said shaft and extending generally radially outwardly from the shaft, said arm means being subject to rotation for applying a closing force to the trailing flap of the box when the box reaches said predetermined position,

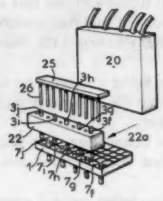
spring means interposed between said shaft and said arm means for driving said arm means rotationally to apply said closing force to said trailing flap when said shaft is rotating and for enabling said arm means to yield and limit the force on said flap.

4,233,799

DISTRIBUTING MACHINE FOR PLACING STORED OBJECTS ON GRILL STANDS

Gilles Caille, Paris, France, assignor to Societe Anonyme Expandet, Paris, France

Filed Apr. 27, 1979, Ser. No. 34,280
Claims priority, application France, May 29, 1978, 78 15886
Int. Cl.³ B65B *5/10*
U.S. Cl. 53—154 **5 Claims**



1. A distributing machine for placing stored cylindrical objects on grill stands having pockets in a plurality of rows parallel to the longitudinal axis of the grill, such as plastic expansion pins in grill stands which themselves are plastic, comprising:

(a) a plate carrying grills to be filled and which moves them successively under a plurality of distributing stations, each of which stations fills one of said rows of said grill ;

(b) bulk pin bins to continuously feed pins to the distributing stations;

(c) pin transfer carriages having pin carrying pockets spaced a distance equal to the distance between the centers of alternate pockets of said grill to transfer a plurality of pins from the distributing stations to the grills,

(d) drive means to move the transfer carriages over the grills longitudinally and transversally relative to said grills and,

(e) push rod means to transfer the pins from the transfer carriages into alternate pockets of a single row of the grills carried by the plate, (f) control means for said drive means to transversally move said carriages filled with one set of pins from the distributing stations to over one of said rows of the grills to thereby allow said push rod means to transfer said pins to alternate pockets of said one row and to longitudinally move said carriages a distance equal to the distance between the centers of two adjacent pockets of the grill after receipt of a second set of pins from said distributing stations to thereby allow said push rod means to transfer said second set of pins into the remaining alternate empty pockets of said one row of the grills.

4,233,800

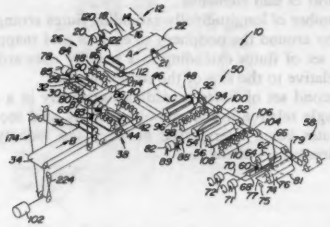
ENVELOPE OPENER

William J. Long, Birmingham; Larry W. Roberts, Fairfield, and H. Ross Williams, Birmingham, all of Ala., assignors to Amer-O-Matic Corporation, Birmingham, Ala.

Continuation-in-part of Ser. No. 826,613, Aug. 22, 1977, Pat. No. 4,142,430. This application Dec. 20, 1978, Ser. No. 971,273

Int. Cl.³ B43M *7/02*

U.S. Cl. 53—381 R **12 Claims**



1. An improved envelope opener, comprising:

a rotatable shear barrel having at least one shear blade for shearing an edge of an envelope;

a pivotable anvil assembly operatively asociated with said shear barrel;

said anvil assembly having an anvil blade,

contact means operatively associated with said shear barrel and said anvil assembly and disposed in relation to said anvil blade to contact said shear blade as said shear barrel rotates and thereby pivotably displace said anvil assembly from a home position with respect to said shear barrel;

means for pivotaby returning said anvil assembly towards said home position with respect to said shear barrel as said shear barrel continues to rotate;

a pivotable gate disposed downstream of said shear barrel;

said gate having a stop member;

means for transporting said envelope from said shear barrel to said gate;

means for causing said gate to pivot downwardly to pass an envelope, and

a support rod disposed in proximity to said gate stop member for supporting said envelope when said gate is pivoted downwardly.

4,233,801

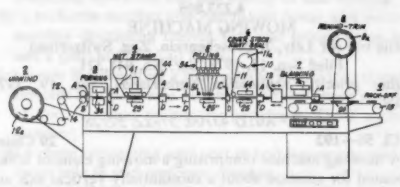
APPARATUS AND PROCESS FOR THE MANUFACTURE OF DISPOSABLE THERMOMETERS

William E. R. Watt, Barto, Pa., assignor to Ashley-Butler, Inc., Somerville, N.J.

Filed Jul. 31, 1978, Ser. No. 929,402

Int. Cl.³ B65B *47/02*

U.S. Cl. 53—453 **16 Claims**



10. Method for producing from stretchable film a marked laminated package containing a product with precise registration between the product and the marking comprising the steps of:

supply a continuous web of a coated stretchable substrate film along a processing path, said web having a central portion to be operated upon and integral edge portions, at least as wide as said central portion, to be used for handling said web;

advancing said substrate web along said path with indexed movement by gripping said edge portions while carefully guiding it laterally in the path by guide means comprising a base member and a cover member having aperture means therebetween for precisely passing said substrate web, and said cover member comprises means for passing said product element on said web;

operating on said web at respective stations along said path including the steps of:

marking the central portion of said substrate web with indicia;

depositing at least one product element to be packaged on said central portion of said substrate web in registration with said indicia;

providing a continuous web of a cover film and sealing it to said substrate web in said central portion with said product element disposed therebetween to form a laiminated package containing said product element;

holding said edge portions of said substrate web at the operating stations during each of said operating steps; and

separating said laminated package from said webs.

4,233,802

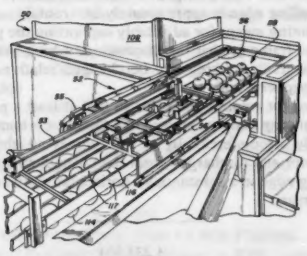
PACKAGING MACHINE

John L. Booth, Richton Park, and Peter A. Rittmaster, Chicago, both of Ill., assignors to International Honeycomb Corporation, Park Forest South, Ill., by said John L. Booth

Continuation-in-part of Ser. No. 876,841, Feb. 10, 1978, abandoned. This application Jan. 25, 1979, Ser. No. 6,085

Int. Cl.³ B65B *5/08, 5/06*

U.S. Cl. 53—475 **24 Claims**



1. A machine for automatically packaging articles into expanded honeycomb and into a container comprising means for locating a container at a loading station of the packaging machine to be filled and moving the container out of the loading station after it has been filled, means for loading articles to be packaged on a carrier assembly disposed outside of the loading station, means for moving said carrier assembly into and out of the loading station of the packaging machine, means for automatically providing in said loading station below said carrier assembly a honeycomb expander tray on which is located a separator sheet and an open honeycomb section for receiving articles and for removing the tray after the honeycomb section and separator sheet have been removed therefrom, and means for lifting said articles from said carrier assembly and depositing them in said open honeycomb and subsequently lifting the filled honeycomb and separator sheet from said tray and then depositing the same in a container located therebelow.

4,233,803

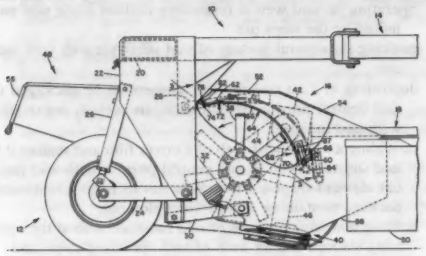
ADJUSTABLE CONDITIONING PLATE FOR AN IMPELLER MOWER-CONDITIONER

Wilbur M. Davis; Bobby G. Sawyer, both of Ottumwa, Iowa; John A. Nichols, Brookston, Ind., and John F. Husman, Silvis, Ill., assignors to Deere & Company, Moline, Ill.

Filed May 4, 1978, Ser. No. 902,654

Int. Cl.[3] A01D *84/00*

U.S. Cl. 56—14.9 **12 Claims**



1. In a mobile mower-conditioner for advancing over a field to cut and condition crop material and including a frame, an improved impeller-type crop handling and conditioning means comprising:

an impeller rotor for engaging cut crop material rotatably mounted in the frame and having an axis of rotation approximately transverse the machine;

a concave guide plate having an inner surface, partially wrapping and generally concentric with the rotor, extending over only approximately the forward upper quadrant of the rotor and spaced radially from the rotor periphery, the inner surface cooperating with that periphery to define a transversely and circumferentially extending conveying channel, said guide plate having with respect to rotor rotation leading and trailing edges and being disposed so that a tangent to the inner surface adjacent the trailing edge is approximately horizontal;

mounting means for adjustably supporting the guide plate in the frame so that the disposition of both the leading and the trailing edges may be changed relative to the rotor periphery; and

means for rotating the rotor so that at least a portion of the cut crop material engaged by the rotor is conveyed generally circumferentially in the conveying channel by the rotor and discharged from the channel adjacent the trailing edge in a substantially horizontal rearwardly directed stream.

4,233,804

CORN HEAD SNAPPING ROLLS

Thomas R. Fischer, Wapakoneta, and Robert A. Stelzer, Celina, both of Ohio, assignors to Paul Revere Corporation, Greenwich, Conn.

Filed Apr. 9, 1979, Ser. No. 28,099

Int. Cl.[3] A01D *45/02*

U.S. Cl. 56—104 **7 Claims**

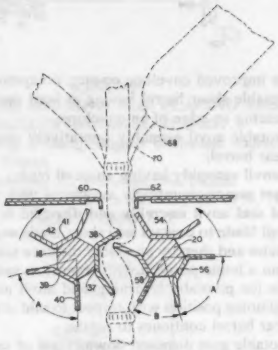
1. In a corn head attachment adapted to be mounted at the forward end of a corn harvester, said corn head having a forward projecting row unit which includes a subframe on which is supported a stripper plate having a fore and aft extending slot for receiving stalks of corn, said row unit also including a pair of spaced apart forward projecting gear driven elements, said elements being arranged equidistant and symmetrically below and at the rearmost end of the slot in said stripper plate, the leftmost one of said elements as viewed from a position forward of said row unit being rotatably driven clockwise by said gear means whereas the rightmost one of said elements is driven counter-clockwise by said gear means, the axes of said elements being parallel both to each other and with the plane containing said stripper plate, the improvement which comprises:

a pair of fore and aft extending snapping rolls, each having a central shaft, said snapping rolls being transversely spaced apart beneath said stripper plate on opposite sides of the slot therein, the base end of the first roll being drivingly connected to and in axial alignment with the leftmost of said elements, the base end of the second roll being drivingly connected to and coaxially aligned with the rightmost of said elements;

a number of longitudinally extending flutes arranged in two sets around the periphery of each of said snapping rolls;

one set of flutes extending in a radially outward direction relative to the axis of the snapping rolls;

a second set of flutes extending outwardly in a non-radial angle relative to the axis of said rolls, said second set of flutes being interspersed between the radially outward directed set of flutes;



the height of said flutes being such that the tips of said odd and even numbered flutes all lie on an imaginary circle placed concentric with and perpendicular to the axis of said snapping rolls, the maximum height of said flutes being such that the flutes of one roll must interleave with the flutes of the other roll throughout a portion of the length of said snapping rolls; and

synchronizing means for rotating said snapping rolls in unison such that the sequence of intermeshing flutes in the region between the axes of said snapping rolls comprise the repetitious rotational passage of a non-radial flute from one roll, a non-radial flute from the second roll, a radial flute from the first roll, a radial flute from the second roll and repeat, the rotational passage of a non-radial flute generating an action whereby the stalk of corn is deeply pinched as it is drawn through said corn head.

4,233,805

MOWING MACHINE

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Sep. 11, 1978, Ser. No. 941,321

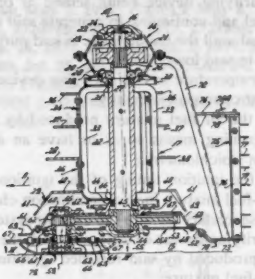
Claims priority, application Netherlands, Sep. 19, 1977, 7710240

Int. Cl.[2] A01D *43/00, 57/22, 57/28*

U.S. Cl. 56—192 **29 Claims**

1. A mowing machine comprising a mowing element which is mounted for rotation about a substantially vertical axis and which includes a cutting member, the machine further comprising a guide member which completely covers said cutting member except for a portion of said cutting member where it extends forward of said guide member during part of its rotation whereby to cut crop in its forward path of movement, and crop displacing means mounted on said guide member for conveying crop cut by said cutting member over said guide member, said guide member including a downwardly extend-

ing screen portion disposed behind said mowing element with respect to the intended normal direction of travel of the machine, said crop displacing means comprising a plurality of tines which are movable about a further substantially vertical



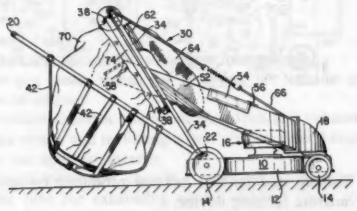
axis spaced behind said first-mentioned vertical axis, said tines rotating through said first-mentioned vertical axis and proximate to where said cutting member rotates forward of said guide member, said guide member serving as a housing for a driving mechanism of said mowing element.

4,233,806

SELF-BAGGING DEVICE FOR POWERED LAWN TOOLS

Charles M. Richardson, 133 Lodge Ave., Huntington Station, N.Y. 11746

Filed Feb. 21, 1979, Ser. No. 13,284
Int. Cl.³ A01D *35/26*
U.S. Cl. 56—202 **15 Claims**



1. In a lawn tool comprising a motor and a housing mounted on wheels in which grass cuttings and/or leaves are discharged in a stream of air through a port in said housing, means for collecting said cuttings and/or leaves comprising:

(a) a frame mounted toward the rear of said housing and extending upwardly and rearwardly of said housing;

(b) a perforate member attached to said frame, said perforate member containing therein first and second large holes and a plurality of small holes;

(c) means for mounting a substantially impervious container beneath said perforate member with the upper periphery of said container against the periphery of said perforate member;

(d) a chute connecting said port in said housing to said first large hole in said perforate member;

(e) said small holes in said perforate member being sized to permit the flow of air therethrough while substantially blocking the flow of solid matter entrained in such air; and

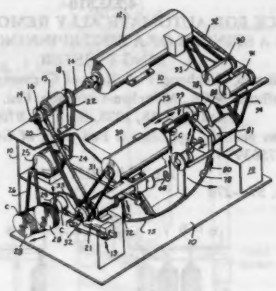
(f) means for mounting on said perforate member a container which is permeable to air, said mounting means holding an open end of said container adjacent said second large hole such that air flowing from said hole enters the open end of said container.

4,233,807

APPARATUS FOR FORMING TWISTED CONDUCTOR UNITS

Edward R. Venable, Gwinnett, Ga., assignor to Western Electric Company Inc., New York, N.Y.

Filed May 31, 1979, Ser. No. 43,991
Int. Cl.³ H01B *13/02*
U.S. Cl. 57—58.52 **7 Claims**



1. Apparatus for forming twisted conductor units comprising a first power transmission train having a rotatable member defining a cavity coupled with a power source and being mounted for rotation about an axis; a bow mounted to said first power transmission train rotatable member for revolutionary movement in an orbit about a reel take-up space; means for supporting and rotating a reel about a reel axis within said reel take-up space; and a second power transmission train extending through said first power transmission train rotatable member cavity offset from said axis coupling said reel supporting and rotating means with a power source.

4,233,808

TOBACCO TYING PRODUCT

Edward T. Gieske, Jr., Chattolanee Hill, Owings Mills, Md. 21117

Filed Apr. 18, 1979, Ser. No. 31,137
Int. Cl.³ D02G *3/02, 3/44;* A24B *3/14*
U.S. Cl. 57—200 **6 Claims**

1. A product suitable for use in tying tobacco leaves together, said product comprising a twine formed from a web consisting essentially of fibrous portions of tobacco plants and substantially exclusive of tissue portions of the plants.

4,233,809

SIZE COMPOSITION FOR GLASS FIBERS

Roy R. Graham, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 20, 1978, Ser. No. 971,453
Int. Cl.³ D02G *3/00*
U.S. Cl. 57—250 **21 Claims**

1. An aqueous forming size composition for treating glass fibers that are to be made into twisted glass fiber strands wherein the forming size composition gives the glass fiber strand flexibility and abrasion resistance during processing operations to produce woven twisted glass fiber strands, wherein the necessity is reduced for removing the size composition from the woven sized twisted glass fiber strands, consisting essentially of

(a) silylated polyazamide in an amount in the range of about 20 to about 94 weight percent of the solids in the aqueous sizing composition,

(b) an emulsifiable lubricant in an amount in the range of about 6 weight percent to about 40 weight percent of the solids in the aqueous sizing composition.

9. A twisted glass fiber strand having the dried residue of an aqueous sizing composition on the fibers in the twisted glass

fiber strand, wherein the residue need not be removed from the strand and where the sizing composition consists essentially of:

(a) silylated polyazamide in an amount in the range of about 20 to about 94 weight percent of the solids in the aqueous sizing composition, and

(b) an emulsifiable lubricant in an amount of at least about 6 weight percent based on the solids of the size composition.

4,233,810

DEVICE FOR AUTOMATICALLY REMOVING A COIL FROM A SPINDLE OF A RING SPINNING FRAME OR A RING TWISTER

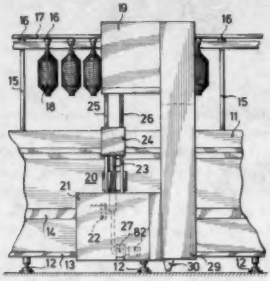
Heinz Kamp, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,394

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1977, 2756397

Int. Cl.³ D01H *9/10*

U.S. Cl. 57—270 **6 Claims**



1. In a ring spinning or twisting frame having a traveling device drivable from work station to work station along the frame for successively removing coils from the spindles automatically, the improvement therein comprising an axially displaceable coil-core releasing ring operatively associated with each spindle of a respective work station at a location below a respective foot of a coil-core receivable on the spindle; the traveling device having means connectible with said releasing ring for releasing a coil core from a respective spindle whereon the coil core is mounted, and having a coil transporter connectible to the respective coil-core, said coil-core releasing means being pivotable and limitedly reciprocable, said coil-core releasing means being actuatable in a first operating cycle for releasing a coil core, and said coil transporter being actuatable in a second operating cycle for transporting the coil core away from the respective spindle.

4,233,811

EXHAUST GAS REACTION CONTROL SYSTEM

Kenji Masaki, No. 30-8, Nagahama, Kanazawa-ku, Yokohama City, Japan

Continuation of Ser. No. 690,106, May 26, 1976, abandoned. This application Apr. 20, 1978, Ser. No. 898,021

Claims priority, application Japan, May 30, 1975, 50/64998

Int. Cl.³ F01N *3/10, 3/14;* **F02M** *25/06*

U.S. Cl. 60—274 **4 Claims**

1. In a method of operating an internal combustion engine having an induction system including an air-fuel mixture forming device, a combustion chamber, an exhaust system including an exhaust gas purifying device and an exhaust gas recirculation system interconnecting said induction and exhaust systems, the steps of:

recirculating exhaust gases from said exhaust system to said induction system for lowering the peak combustion temperature in said combustion chamber;

sensing the temperature prevailing in said purifying device;

generating a first command signal upon said temperature in said purifying device being sensed at or below a predetermined lower level and continuing to generate said first command signal until the temperature in said purifying device reaches a predetermined upper level;

generating a second command signal upon said temperature in said purifying device being sensed at or above said upper level and continuing to generate said second command signal until the temperature in said purifying device decreases to said lower level;

raising the temperature in said purifying device in response to said first command signal by

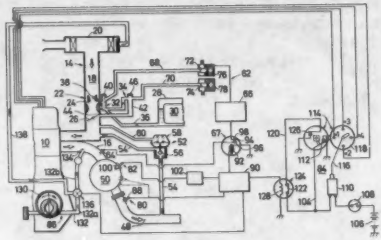
1 enriching the air fuel mixture produced by said air-fuel mixture forming means so as to have an air-fuel ratio lower than stoichiometric;

2 retarding the ignition timing of the ignition of said enriched air-fuel mixture in said combustion chamber;

3 supplying secondary air into the exhaust system upstream of said purifying device so as to mix with the combustion products produced by said retarded ignition of said enriched air-fuel mixture;

4 producing sparks in said purifying device so as to positively ignite the mixture of said combustion products and said secondary air and produce heat to raise the temperature within said purifying device;

lowering the temperature within said purifying device in response to said second commmand signal by;.



1 leaning said air-fuel mixture produced by said air-fuel mixture forming device;

2 sensing the oxygen content in the exhaust gases in said exhaust system and producing an output signal indicative of the oxygen content sensed;

3 controlling the air-fuel ratio of the air-fuel mixture produced by said air-fuel mixture forming device in accordance with said output signal thus maintaining the temperature within said purifying device at which spontaneous self-supporting combustion therein occurs, substantially constant; p1 4 advancing the ignition timing of the ignition of said leaned air-fuel mixture in said combustion chamber so as to efficiently and rapidly combust said mixture thus reducing the amount of combustible matter contained in the exhaust gases subsequently exhausted into said exhaust system;

5 terminating the supply of secondary air into said exhaust system;

6 terminating the production of sparks in said purifying device; and

7 utilizing the reduced peak combustion temperature by said recirculation of exhaust gas in combination with said steps of leaning, sensing, controlling, advancing, terminating and terminating to feed exhaust gas having a relatively low temperature into said purifying device to facilitate the cooling thereof.

4,233,812

GAS DISCHARGE APPARATUS

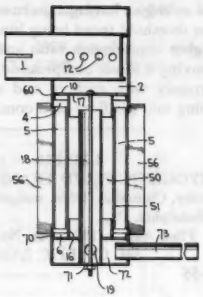
Hans K. Leistritz, Stegwiesen 8, D 7891 Kussaberg 2, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,247

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718944; May 2, 1977, 2719513; May 3, 1977, 2719634; May 7, 1977, 2720558; May 14, 1977, 2721956; May 18, 1977, 2722422; Jun. 21, 1977, 2727728; Jul. 2, 1977, 2730007; Jul. 6, 1977, 2730480; Jul. 25, 1977, 2733443; Oct. 24, 1977, 2747655; Oct. 26, 1977, 2747959

Int. Cl.[3] F01N *3/02;* F02M *35/00;* F01N *1/08;* F28D *7/10*

U.S. Cl. 60—320 4 Claims



1. An exhaust gas muffler apparatus, comprising:

exhaust gas intake means for receiving hot exhaust gases from an engine;

an expansion chamber communicating with said exhaust gas intake means and including a first wall member having at least one aperture therein;

an exhaust expansion chamber including an exhaust gas outlet tube for exhausting cooled exhaust gases to the atmosphere;

a plurality of first elongated channels each having a first inlet and a first outlet and extending between said first wall member and a first region adjacent said exhaust expansion chamber, the first inlets being interconnected with said at least one aperture and each of the first outlets opening into said first region, and said plurality of first elongated channels having at least one outer wall member exposed to the atmosphere;

at least one second elongated channel having a common wall with respective walls of said plurality of first elongated channels and a second inlet and second outlet, said second inlet being interconnected with the first outlets, and said second outlets opening into a second region adjacent said wall member;

an exhaust gas tube extending between said exhaust expansion chamber and said first region and having a wall member common to said second elongated channel; and

a plurality of fins extending from the common wall of said elongated second channel through said at least one outer wall member into the atmosphere, said plurality of fins together with said at least one outer wall member and the common wall of said elongated second channel, forming said plurality of first elongated channels.

4,233,813

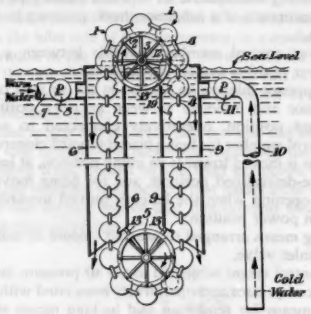
OCEAN THERMAL ENGINE

Walter J. Simmons, Martinsburg, W. Va., assignor to University of Delaware, Newark, Del.

Filed Mar. 15, 1979, Ser. No. 20,639

Int. Cl.[3] F03G *7/06*

U.S. Cl. 60—496 4 Claims



1. An ocean thermal engine comprising

a. a series of rigid containers disposed in spaced relation to form an endless chain;

b. rotatable supporting means for suspending said endless chain substantially vertical;

c. open ducts through which the two vertical lengths of the chain of containers extend;

d. means for circulating seawater from near the surface through one duct and means for circulating colder seawater through the other duct;

e. each container having means for confining a thermodynamic fluid, said thermodynamic fluid being capable of vaporizing within the temperature range of the seawater in said first duct and condensing within the temperature range of the seawater in said second duct, said means effecting discharge of seawater from the container upon vaporization of the fluid and intake of seawater upon condensation of the fluid, thereby effecting a change in buoyancy of the containers and their movement through said ducts;

f. means for recovering useful power from the movement of said chain.

4,233,814

SUPERCHARGED INTERNAL COMBUSTION ENGINES

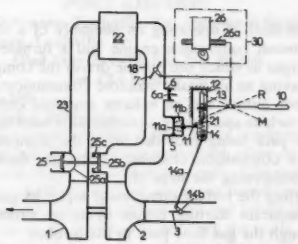
Bernard Thore, 95, rue de Longchamp, 75116 Paris, France

Filed Aug. 16, 1978, Ser. No. 934,021

Claims priority, application France, Aug. 22, 1977, 77 25571

Int. Cl.[3] F02B *37/00*

U.S. Cl. 60—601 7 Claims



1. A power unit comprising:

an internal combustion engine capable of operating without supercharging,

a supercharging turbine-compressor unit whose turbine is connected to receive the exhaust gases of the engine and whose compressor is connected to supply compressed air to an intake pipe of the engine,

a non-return check valve connected to said intake pipe for admitting atmospheric air into said intake pipe in response to occurence of a subatmospheric pressure in said intake pipe,

a power control member movable between a maximum power position and an idling position,

a compressor inlet valve located in the air inlet of the compressor and movable between an open position and a closed position, operatively connected to said power control member for being biased toward closure when the latter is moved towards its idling position, at least beyond a pre-determined position, and for being moved toward full opening when the latter is moved towards its maximum power position,

locking means arranged to prevent closure of said compressor inlet valve,

and control means subjected to the air pressure delivered by the compressor and operatively associated with said locking means for rendering said locking means effective in response to the outlet pressure of the compressor being greater than a predetermined threshold.

4,233,815

METHODS OF SUPERCHARGING A DIESEL ENGINE, IN SUPERCHARGED DIESEL ENGINES, AND IN SUPERCHARGING UNITS FOR DIESEL ENGINES

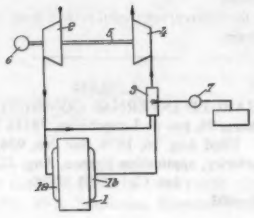
Jean F. Melchior, Neuilly-sur-Seine, France, assignor to Etat Francais, Paris, France

Division of Ser. No. 721,576, Sep. 8, 1976, Pat. No. 4,125,999, which is a division of Ser. No. 437,748, Jan. 29, 1974, Pat. No. 3,988,894, which is a continuation-in-part of Ser. No. 345,968, Mar. 29, 1973, abandoned, and a continuation-in-part of Ser. No. 384,566, Aug. 1, 1973, abandoned, which is a continuation of Ser. No. 139,080, Apr. 30, 1971, abandoned. This application Aug. 28, 1978, Ser. No. 937,141

Claims priority, application France, May 5, 1970, 70 16289; Apr. 6, 1972, 72 12113; Mar. 21, 1973, 73 10041

Int. Cl.[3] F02B *37/00*

U.S. Cl. 60—606 **11 Claims**



1. A method of operating an assembly of a supercharged diesel internal combustion engine and a turbine-compressor supercharger in which the turbine drives the compressor, said engine having an air intake manifold communicating with the compressor output and an exhaust manifold communicating with the turbine and having a compression ratio less than 12, a gas flow path being provided from the compressor to the turbine, a combustion chamber in the gas flow path, said method comprising the steps of:

(a) starting the turbine-compressor supercharger in rotation by separate starting means so as to initiate gas flow through the gas flow path to the turbine,

(b) igniting fuel in the combustion chamber to heat gases flowing through said gas flow path and entering the turbine so as to bring the turbine-compressor supercharger into self-maintaining operation at or above a minimum threshold speed sufficient for the compressor to deliver air at temperature and pressure conditions high enough to provide self-ignition of the air fuel mixture in the engine at the end of its compression strokes when the engine is just about to start,

(c) starting said engine with said air from the compressor at said temperature and pressure conditions entering the engine intake manifold,

(d) thereafter, while operating said engine and supercharger assembly after start-up, maintaining the speed of the turbine-compressor supercharger at or above said minimum threshold speed which provides temperature and pressure conditions sufficient to enable said self-ignition at the end of the compression strokes when the engine has begun to operate, said minimum threshold speed having a fixed value for an engine having a given compression ratio, said minimum threshold speed being lower for an engine having a higher compression ratio and being higher for an engine having a lower compression, ratio and

(e) concurrently with each of said steps (a) through (d) maintaining said gas flow path constantly open.

4,233,816

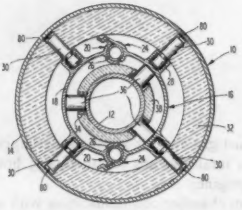
CRYOGENIC FLUID TRANSFER LINE

Steve L. Hensley, Columbus, Ohio, assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 8, 1979, Ser. No. 64,657

Int. Cl.[3] F17C *7/02*

U.S. Cl. 62—55 **6 Claims**



1. A cryogenic fluid transfer line comprising:

(a) an interior conduit for passage therethrough of cryogenic fluid;

(b) an exterior conduit concentrically spaced about said interior conduit, defining the exterior of said line;

(c) an annular heat transfer shield generally concentric with and interjacent to said interior and exterior conduits, comprising:

1. at least one longitudinally extending resilient arcuate member including a longitudinally extending generally arcuate hooking edge;

2. at least one longitudinally extending resilient arcuate member including a longitudinally extending generally arcuate catching edge;

said hooking and catching edge members being interlockingly engageable with each other when said member including the hooking edge is flexed to a smaller arcuate radius, positioned with said hooking edge disposed inwardly of said catching edge, and then relaxed; each set of engaged hooking and catching edges defining a hollow generally cylindrical nest having a substantially closed curved surface, each nest extending longitudinally substantially the length of said shield;

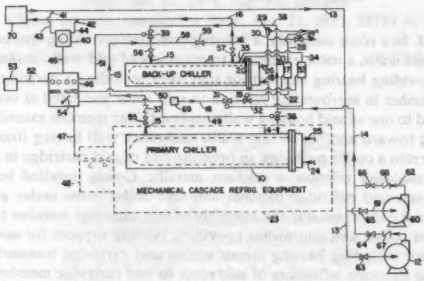
3. a longitudinally extending heat transfer conduit resident within each nest, retained therewithin by circumferential pressure exerted radially inwardly thereon by portions of said engaged arcuate hooking and catching edges defining said nest;

(d) first heat insulative spacer means for retaining said interior conduit within and spaced from said annular shield;
(e) second heat insulative spacer means for retaining said annular shield within and spaced from said exterior conduit;
(f) radiation shields concentric with said interior conduit and interposed between said interior conduit and said annular heat transfer shield, said first insulative spacer means passing therethrough; and
(g) radiation shields concentric with said exterior conduit and interposed between said exterior conduit and said annular heat transfer shield, said second heat insulative spacer means passing therethrough.

4,233,817
REFRIGERATION APPARATUS

Steven J. Toth, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 3, 1978, Ser. No. 957,465
Int. Cl.³ F25B 7/00, 25/00
U.S. Cl. 62—175 **9 Claims**



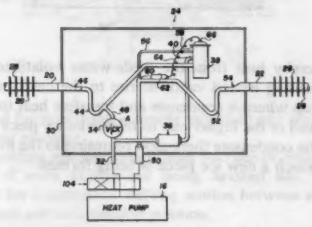
1. Refrigeration apparatus for maintaining the temperature in a circulating refrigerant at or below a predetermined level which comprises in combination a first chiller associated with a primary refrigeration system, a second chiller, a refrigerant pump, refrigerant conduits for circulating refrigerant in series through said pump and said first and second chillers, a first sensor for sensing the temperature of the circulating refrigerant and providing output signals based thereon, valve means associated with said second chiller and responsive to signals from said first sensor for supplying liquid nitrogen from a source to said second chiller whenever the temperature of the circulating refrigerant rises above a predetermined level, a second sensor for sensing the temperature of the circulating refrigerant and providing output signals based thereon, and valve means associated with said second chiller and responsive to signals from said second sensor for stopping the supply of liquid nitrogen to said second chiller whenever the temperature of the circulating refrigerant drops below a predetermined level.

4,233,818
HEAT EXCHANGE INTERFACE APPARATUS

William R. Lastinger, 1533 Winding Way, Clearwater, Fla. 33516

Filed Jun. 23, 1978, Ser. No. 918,595
Int. Cl.³ F25B 13/00
U.S. Cl. 62—224 **6 Claims**

1. An apparatus for interfacing between heat exchange tubing, of the type designed to be installed along the perimeter of a generally enclosed space to modify temperature within the enclosed environment, and a working fluid device, including a compressor having an outlet or pressure side and an inlet or vacuum side and a fluid expansion member, for supplying a temperature modifying fluid to the heat exchange tubing for distribution along the perimeter of the generally enclosed space, said interfacing apparatus comprising:
first conduit means for connection at one end into a fluid path in the outlet side of the compressor, in a cooling mode of operation of the working fluid device, and for connection at the other end thereof into one end of the heat exchange tubing installed about the perimeter of the generally enclosed space;
second conduit means for connection at one end into a fluid path in the inlet side of the compressor, in a cooling mode of operation of the working fluid device, and for connection at the other end thereof into the other end of the heat exchange tubing installed about the perimeter of the generally enclosed space;
valve means interposed between said one end and said other end of said first conduit means for regulating the amount of working fluid, cooled by the fluid expansion member within the working fluid device, that passes from said first end to said second end of said first conduit means, said valve means comprising,



a variable, self-adjusting valve means for controlling the amount of cooling fluid flowing through the apparatus for interfacing;
temperature sensing means mounted upon said second conduit means and being operably connected to said valve means for adjusting said valve means in accordance with the temperature of the cooling fluid within said second conduit means;
third tubing means connected at one end into said second tubing means and at the other end into said variable, self-adjusting valve means for at least partially offsetting internal pressure with said valve means to facilitate opening said valve means;
liquid trap means formed intermediate the ends of each of said first conduit means and said second conduit means to isolate the inlet side of the compressor from liquid; and
eccentric coupling means connected between each of said first and second conduit means and a respective end of said heat exchange tubing for permitting liquid within the heat exchange tubing to pass into said trap means.

4,233,819
AUTOMATIC ICEMAKER WITH SIMPLIFIED ICE PIECE EJECTION

Richard L. Stottmann, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

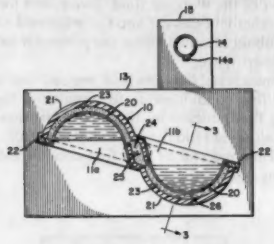
Filed May 3, 1979, Ser. No. 35,380
Int. Cl.³ F25C 1/10
U.S. Cl. 62—349 **5 Claims**

1. An icemaker comprising:
a rotatable ice mold having a plurality of ice forming cups inverted and offset with respect to each other on opposite sides of the mold's axis of rotation, each of the cups having a concave wall in which ice pieces are formed and a back wall spaced from said concave wall and joined thereto so as to form an enclosed cavity between the walls, the cavities of cups adjoining on opposite sides of said axis of rotation being in fluid communication with each other;
a volatile liquid disposed in said cup cavity so as to be in

thermal contact with a substantial portion of the cup's concave wall when the cup is in its ice forming position;

means for rotating the mold between alternate ice forming positions in which the cavity of an upwardly facing cup is lower than the cavity of the adjoining downwardly facing cup with which it is in fluid communication; and

means for supplying a controlled amount of fresh water to the upwardly facing cup when in its ice forming position,



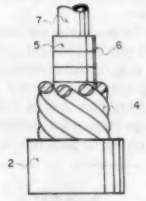
whereby heat from the fresh water volatilizes said liquid causing heated vapor to rise to the cavity of the higher cup where it condenses and transfers heat to the concave wall of the higher cup to release an ice piece held therein, the condensate thereupon returning to the lower cavity in which a new ice piece is being formed.

4,233,820

FLEXIBLE DRILL PIPE

W B Driver, 19 Sheridan Rd., Arnold, Md. 21012

Division of Ser. No. 799,088, May 20, 1977, Pat. No. 4,149,391.
This application Feb. 14, 1979, Ser. No. 12,059
Int. Cl.[3] F16C *1/02*
U.S. Cl. 64—2 P **8 Claims**



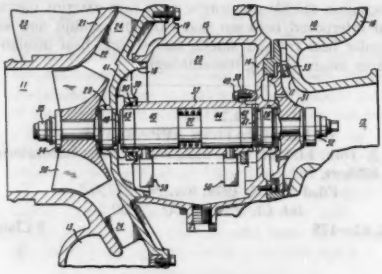
1. A flexible drill pipe which comprises, a closed pitch cylindrical shaped coil of wire rod, a plurality of wire wound solid flexible shafts, an internal support assembly, a female tool joint attached to one end portion of said rod, a male tool joint attached to the other end portion of said rod, said internal support assembly being laid through said coil of wire rod and extending from said female tool joint to said male tool joint, said shafts being laid through said coil of wire rod wrapped around said assembly, respective ends of said shafts being attached to said female tool joint and said male tool joint, said assembly supports said shafts and said coil of wire rod under torsion loads and keeps said shafts and said coil of wire rod from collapsing under torsion loads, said assembly providing a means for drilling fluids to be pumped through said drill pipe, said assembly being constructed to provide an even distribution of flexibility over the length of said coil of wire rod.

4,233,821

ROTOR SUPPORT

Dennis W. Desalve, Findlay, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Feb. 28, 1979, Ser. No. 16,113
Int. Cl.[3] F16D *3/84*
U.S. Cl. 64—32 R **5 Claims**



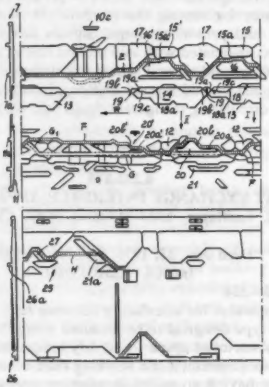
1. In a rotor assembly, a housing structure providing spaced apart walls, a rotor extending transversely of said walls, means providing bearing support for said rotor including a cartridge member in surrounding relation to said rotor and fixed at one end to one of said housing walls, said cartridge member extending toward another of said walls, said other wall having fixed thereto a collar receiving an opposite end of said cartridge in a telescoping relation, a resilient metallic C-ring installed between said cartridge member and said collar to be under an initial compression in the assembly of said cartridge member to said collar, and said means providing bearing support for said rotor including bearing means within said cartridge transmitting dynamic influences of said rotor to said cartridge member and through said cartridge member and said C-ring to said housing.

4,233,822

KNITTING METHOD AND MACHINE

Francesco Lonati, Brescia, Italy, assignor to Costruzioni Meccaniche Lonati S.p.A., Brescia, Italy

Filed Apr. 10, 1978, Ser. No. 894,782
Claims priority, application Italy, Apr. 21, 1977, 22713 A/77
Int. Cl.[2] D04B *9/10, 15/06*
U.S. Cl. 66—14 **7 Claims**



1. A method of manufacturing knitted garments on a double-cylinder circular knitting machine having an upper and a lower

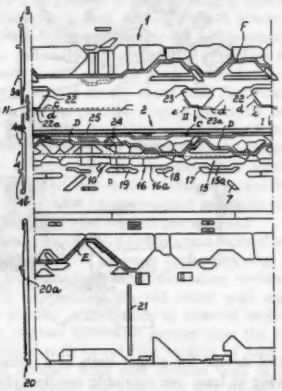
needle cylinder, latch needles therein including upper and lower cylinder needles, stitch sinkers within said lower needle cylinder, each of said stitch sinkers having a hook, and sliders for controlling said needles, comprising the steps of controlling said stitch sinkers to move in a projecting position and said upper and lower cylinder needles to pick up yarn and form loops in said yarn, holding said upper cylinder needles in a raised position after having formed said loops, withdrawing said stitch sinkers from said projecting position with said hooks engaging only portions of said yarn next to said lower cylinder needles, successively lowering, in a substantially complete manner, said upper cylinder needles while causing said stitch sinkers to newly project and to pick up portions of said yarn held between said upper cylinder needles, again withdrawing said stitch sinkers with said yarn portions, and controlling said lower and said upper cylinder needles to further pick up yarn only after said sinkers have been again withdrawn.

4,233,823

DOUBLE-CYLINDER CIRCULAR KNITTING MACHINE

Francesco Lonati, Brescia, Italy, assignor to Costruzioni Meccaniche Lonati S.p.A., Brescia, Italy

Filed Apr. 10, 1978, Ser. No. 894,883
Claims priority, application Italy, Apr. 21, 1977, 22714 A/77
Int. Cl.[2] D04B 9/10, 15/08
U.S. Cl. 66—14 **4 Claims**



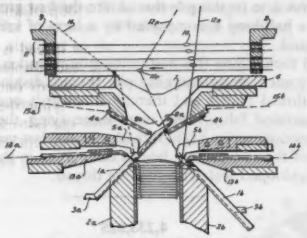
1. A double-cylinder circular knitting machine having an upper and a lower needle cylinder, latch needles movable therein, at least one yarn feed, sliders associated with said latch needles and having control butts, said sliders comprising sliders in said upper needle cylinder having said control butts movable along an upper knitting track to cause corresponding rib needles to knit in said upper needle cylinder, sliders within said lower needle cylinder having said control butts movable along a lower knitting track to cause corresponding needles to knit in said lower needle cylinder, and needle-free sliders within said lower needle cylinder corresponding to said rib needles knitting in said upper needle cylinder, a cam box having cams defining a non-knitting track for said control butts of said needle-free sliders, said non-knitting track having at least portions thereof at a level at which said needle-free sliders engage said rib needles before the latter take up yarn, to cause opening of the latches of said rib needles while said sliders in said upper needle cylinder corresponding to said rib needles move with said control butts along said upper knitting track, means for selectively bringing said needle-free sliders with said control butts into said non-knitting track and means for returning said needle-free sliders with said control butts into said lower knitting track, wherein said non-knitting track is above said lower knitting track all around said cam box.

4,233,824

WARP KNITTING OF DOUBLE JACQUARD-PATTERNED PILE FABRIC

Manfred Schneider, Karl-Marx-Stadt, German Democratic Rep., assignor to Veb Textima Wirkmaschinenbau Karl Marx Stadt, Karl Marx stadt, German Democratic Rep.

Continuation-in-part of Ser. No. 45,852, Jun. 5, 1979, abandoned. This application Jun. 25, 1979, Ser. No. 51,415
Claims priority, application German Democratic Rep., Jun. 8, 1978, 205859
Int. Cl.[3] D04B 23/02
U.S. Cl. 66—87 **17 Claims**



1. A method for producing a double patterned pile fabric on a warp-knitting machine,

the warp-knitting machine comprising two needle-rows, the needles of each needle-row being hooked and being mounted for longitudinal shifting motion between a cast-off position and an extended position,

each needle-row defining a general plane, the two general planes defined by the two needle-rows intersecting at a location towards which the needles of a needle-row move when longitudinally shifted from cast-off to extended position,

each needle of a needle-row being located substantially directly opposite to a corresponding needle of the other row and constituting therewith a needle-pair, the two needle-rows accordingly being constituted by a row of such needle-pairs,

the method comprising the steps of:

(a) longitudinally shifting one and then the other needle of each needle-pair, in alternation, from cast-off to extended position and back to cast-off position;

(b) feeding knitting threads, one per needle, to the needles of one needle-row and effecting the production of one ground fabric, and feeding further knitting threads, one per needle, to the needles of the other needle-row and effecting the production of another and corresponding ground fabric;

(c) feeding to each needle-pair a respective set of pile threads of which differing ones are at differing times in the production of the fabric to become patterning pile threads visible in the fabric's pile pattern, the feeding of each set of pile threads being performed using a respective set of individually displaceable pile-thread guiders;

(d) for so long as a given one of the set of pile threads is not to be a patterning pile thread, keeping it out of the vicinity of the position which the hooks of the needles of the needle-pair assume when in extended position in order that the non-patterning pile thread not be caught by the hook of either needle of the needle-pair, and instead tying the non-patterning pile thread into a first of the two ground fabrics in the form of an unlooped walewise-running thread;

(e) then, when such non-patterning pile thread is to become a patterning pile thread, displacing its pile-thread guider and thereby it in the direction from the first ground fabric towards the second ground fabric and laying it across the second needle of the needle-pair

when the second needle is in extended position, so that both the patterning pile thread and also a knitting thread be during return of the second needle to cast-off position caught in the second needle's hook to tie the pile thread into the second ground fabric in the form of a half-loop accompanied by a loop of knitting thread;

(f) then, with this patterning pile thread now extending between its pile thread guider and the case-off location of the second needle of the needle-pair, laying this pile thread across the first needle when the latter is in extended position so that both this patterning pile thread and also a knitting thread be during return of the first needle to cast-off position caught in the first needle's hook to tie this pile thread into the first ground fabric as a half-loop accompanied by a loop of knitting thread; and

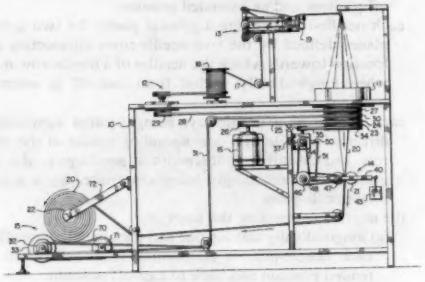
(g) then, when this patterning pile thread is to again become a non-patterning pile thread, displacing its pile-thread guider and thereby it towards one of the two ground fabrics and once more tying the now again non-patterning pile thread into the last-mentioned one of the two ground fabrics once more in the form of an unlooped walewise-running thread.

4,233,825

KNITTING MACHINE

Donald L. Glaspie, Dallas, Tex., assignor to Glitsch, Inc., Dallas, Tex.

Filed May 5, 1978, Ser. No. 903,214
Int. Cl.[2] D04B *35/24, 15/48, 15/88, 35/12*
U.S. Cl. 66—125 A **11 Claims**



1. A knitting machine comprising:

a frame;

a knitting head and cylinder mounted on said frame in position to receive knitting filament fed thereto from above said cylinder and to deliver a tube of knitted fabric downwardly out of said cylinder;

take-down means mounted on said frame below said cylinder for tensioning said knitted tube and drawing it downwardly out of said cylinder;

take-up means mounted on said frame for receiving said knitted tube from said take-down means and winding it up into a roll;

knitting filament feed means mounted on said frame for feeding knitting filament to said knitting cylinder;

power means mounted on said frame for operating said knitting machine;

power train means connecting said power means to said knitting head, said knitting head to said take-up means, and said knitting head to said knitting filament feed means, whereby variations in knitting head speed are instantaneously compensated for by variations in the speed of said feed and take-up means;

said take-down means comprising:

a lever pivotally mounted on said frame;

a variable speed drive means having a throttle;

a pair of pinch rolls mounted on said lever for engaging said knitted tube and drawing it downwardly out of said cylinder;

a pulley and belt system interconnecting said drive means and said pinch rolls;

means for variably biasing said pinch rolls away from said cylinder; and

means for operating said drive means throttle to increase the speed of said drive means upon downward excursions of said throttle and decrease the speed of said drive means upon upward excursions of said throttle.

4,233,826

CONTROL DEVICE FOR STRIPER UNITS IN CIRCULAR KNITTING MACHINES

Francesco Lonati, Brescia, Italy, assignor to Construzioni Meccaniche Lonati S.p.A., Brescia, Italy

Filed Oct. 11, 1978, Ser. No. 950,411
Claims priority, application Italy, Oct. 21, 1977, 28877 A/77
Int. Cl.[3] D04B *15/60, 15/80*
U.S. Cl. 66—140 R **8 Claims**

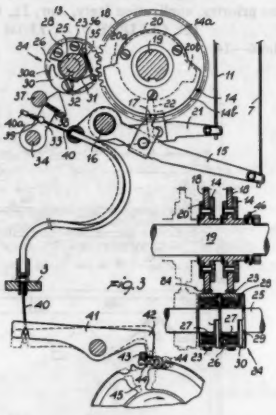


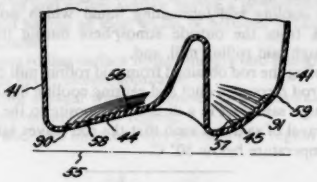
Fig. 3

1. A control device for striper units in a circular knitting machine having at least one rotatable needle cylinder and at least one thread feed comprising a plurality of thread fingers, the device comprising a plurality of first cam disks each corresponding to one of said thread fingers, a common shaft for supporting said first cam disks, control levers each having cam follower means constantly engaging a respective one of first cam disks and each operatively connected to a corresponding one of said thread fingers to control said corresponding one of said thread fingers between an operative thread feeding position and an inoperative thread withdrawing position, a plurality of actuating members each rigid with a corresponding one of said first cam disks, said first cam disks and said actuating members being axially non-displaceable on said common shaft, a plurality of revolvable actuator elements each in constant engagement with a respective one of said actuating members, a rotatable drive shaft for idly supporting said actuator elements, said drive shaft being rotatable at a rotational speed bearing a predetermined speed ratio to the rotational speed of said at least one rotatable needle cylinder, and means for selectively coupling said actuator elements with, and uncoupling from, said drive shaft for predetermined time lapses wherein the respective of said thread fingers are displaced between said operative thread feeding position and said inoperative thread withdrawing position according to a machine knitting program.

4,233,827
UNSYMMETRICAL BASKET FOR AN ORBITAL CLOTHES WASHER

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 28, 1979, Ser. No. 98,226
Int. Cl.[3] D06F *21/06*
U.S. Cl. 68—172 6 Claims



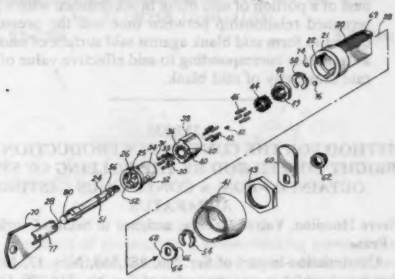
1. A basket for an orbital washer comprising:
an annular outer wall;
a basket bottom wall;
a post projecting vertically upwardly from said basket bottom wall generally parallel to said outer wall and disposed generally centrally thereof;
said basket bottom wall comprising:
a first bottom portion sloping generally upwardly in the radial direction from said outer wall toward said post; said first bottom portion sloping continuously upwardly in the generally circumferential direction from a first circumferential position to a second circumferential position located axially above said first position; and
a second bottom portion sloping generally downwardly from said outer wall toward said post in the radial direction; said second bottom portion sloping continuously downwardly in the generally circumferential direction from said second positon to said first position; said first portion being disposed generally circumferentially opposite said second portion; and
said outer wall having on a first portion thereof adjacent said first bottom portion an inner surface having, over a substantial portion of its height extending vertically upward from the intersection of said outer wall and said first bottom portion, a resistance to relative motion of damp cloth in contact therewith greater than the resistance of said bottom wall to relative motion of said same damp cloth in contact with said bottom wall in the radially outward direction; and said outer wall having on a second portion thereof an inner surface adjacent said second bottom portion having a resistance to relative motion of said same damp cloth in contact therewith less than said resistance to relative motion of said first portion of said outer wall; and said post having a generally vertical smooth surface disposed adjacent said second bottom portion having a resistance to relative motion of said same damp cloth in contact therewith less than said resistance to relative motion of said first portion of said outer wall.

4,233,828
CHANGEABLE COMBINATION, AXIAL PIN TUMBLER LOCK WITH SINGLE INTERFACE

Robert L. Dauenbaugh, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Nov. 22, 1978, Ser. No. 963,156
Int. Cl.[3] E05B *27/00*
U.S. Cl. 70—363 12 Claims

1. An improved changeable, axial pin tumbler lock cooperative with a service key for normal lock operation and cooperative with set keys for changing the lock tumbler combination for subsequent cooperation with a different service key, said lock comprising, in combination:
a fixed barrel having a center line axis, a shear surface transverse to the axis, and a plurality of (n) tumbler passages generally parallel to the axis and to each other, said passages arranged at equal radial distances from the axis;
a rotatable barrel rotatable about the axis and having a shear surface in opposed relation to the fixed barrel shear surface to define a single line of cleavage between the barrels, said rotatable barrel also including a front surface and less than (n) parallel, front tumbler passages, said front tumbler passages being arranged parallel to the axis and in alignment with selected fixed barrel passages when said lock is in the locked position, all of said rotatable barrel passages being at the same radial distance from the axis and also having the same cross sectional shape as the fixed barrel passages, those fixed barrel passages which are not selected for alignment defining storage passages;
bolt means attached to the rotatable barrel and operated in response to rotation of said rotatable barrel;
a plurality of changeable pin tumblers in the fixed barrel storage passages;
locking pin tumblers extending from the fixed barrel passages into the aligned rotatable barrel passages when in the locked position;



biasing means in the fixed barrel continuously biasing tumblers in the fixed barrel passages toward the rotatable barrel shear surface;
drive tumblers having inner tumbler ends in the rotatable barrel passages for engagement by the locking pin tumblers when the lock is in locked position and having opposite ends projecting toward the rotatable barrel front surface for cooperation with a key; and
means for retaining the drive tumblers in said rotatable barrel, said drive tumblers being arranged for engagement by a first service key or an identically bitted first change key for axial translation to position the inner tumbler ends at the single line of cleavage whereby the rotatable barrel may be rotated between a locked and unlocked position, at least one of said rotatable barrel passages being aligned with a fixed barrel storage passage when the lock is rotated to a combination change position, said first change key being removable at both the locked and combination change positions whereby at the combination change position a second change key with a distinct bitting may be inserted in the lock to transfer tumblers to or from the storage passage and thereby alter the lock combination.

4,233,829
APPARATUS FOR SUPERPLASTIC FORMING

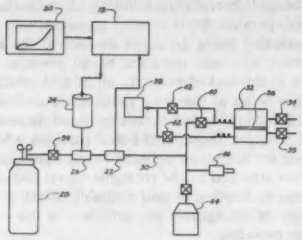
C. Howard Hamilton; Neil E. Paton, both of Thousand Oaks, and John M. Curnow, Agoura, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 839,243, Oct. 4, 1977. This application Oct. 10, 1978, Ser. No. 949,827
Int. Cl.[3] B21B *9/00*
U.S. Cl. 72—38 5 Claims

1. An apparatus for superplastically forming a part comprising:

a die having a surface which is complementary to the shape of the part;

means for holding in said die at a forming temperature a blank of material which exhibits an effective value of strain rate sensitivity at a forming temperature;



means for automatically applying a gas directly against a surface of said blank to create a pressure across the thickness of a portion of said blank in accordance with a predetermined relationship between time and the pressure required to form said blank against said surface of said die at a strain rate corresponding to said effective value of strain rate sensitivity of said blank.

4,233,830

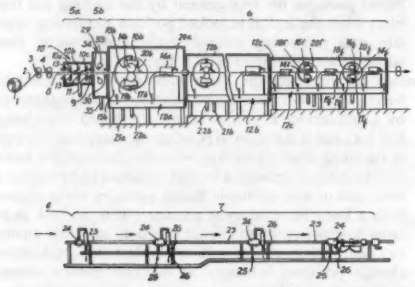
METHOD FOR THE CONTINUOUS PRODUCTION OF A BRIGHT COPPER ROD BY THE ROLLING OF STOCK OBTAINED FROM A CONTINUOUS CASTING APPARATUS

Pierre Houdion, Vaires, France, assignor to Secim, Courbevoie, France

Continuation-in-part of Ser. No. 852,568, Nov. 17, 1977, abandoned, which is a continuation of Ser. No. 734,270, Oct. 20, 1976, abandoned. This application Nov. 14, 1978, Ser. No. 961,386

Int. Cl.³ B21B *9/00, 45/08*

U.S. Cl. 72—38 **3 Claims**



1. A method for the continuous production of bright copper rod from stock after discharge from a continuous casting machine, said stock having been exposed to air and being treated prior to entry into a rolling mill, said method including the steps of:

(a) initiating the breakage and separation of an oxide layer formed on the stock during its passage to the rolling mill by thermal shock and the chemical action of jets of a chemically active liquid at a relatively low pressure of 2–3 bars, the stock being subjected to this action of the low pressure jets for a time from 1 to 5 seconds before entry of the stock into the rolling mill,

(b) descaling said stock after initiation of the breakage of the oxide layer and before its entry in the rolling mill by projecting on said stock jets of liquid at a relatively high pressure of 200–220 bars thus eliminating the flakes of oxide partially detached from the stock during the preceding step, wherein the duration of said descaling is less than the time required for initiating the breakage and separation of the oxide layer as recited in step (b) to simultaneously effect descaling and to maintain said stock as a temperature enabling hot rolling,

(c) hot rolling said stock in said rolling mill in the presence of a cooling and lubricating liquid which isolates said stock from the outside atmosphere during its passage through said rolling mill, and,

(d) cooling the rod obtained from said rolling mill by passing said rod through a duct and causing cooling liquid to flow through said duct in a direction opposite to the direction of travel of said rod such that the rod leaves said duct at a temperature below 80° C.

4,233,831

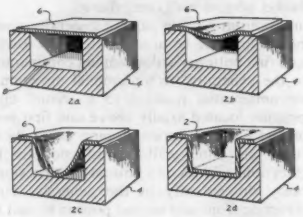
METHOD FOR SUPERPLASTIC FORMING

C. Howard Hamilton, Thousand Oaks, and Edward D. Weisert, Rolling Hills Estates, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 6, 1978, Ser. No. 875,279

Int. Cl.³ B21D *26/04*

U.S. Cl. 72—60 **8 Claims**



1. A method of forming a part comprising the steps of:

providing a blank of material having superplastic characteristics;

providing a die having a surface which is complementary to the shape of the part;

determining a relationship between time during forming and the pressure required to superplastically form said blank against said surface of said die at a suitable substantially constant strain rate;

positioning said blank relative to said die;

bringing said blank to within a temperature range at which said blank exhibits superplastic characteristics; and

applying pressure of varying magnitude to said blank in accordance with said relationship between time and pressure to induce tensile stresses in said blank and superplastically form said blank against surface of said die.

4,233,832

METHOD AND APPARATUS FOR ROLLING METAL WIRE OR ROD INTO WIDE, FLAT STRIPS

Douglas W. Rowell, Washington Ave., Woodbury, Conn. 06798

Filed Jan. 26, 1979, Ser. No. 6,659

Int. Cl.³ B21B *1/24*

U.S. Cl. 72—91 **13 Claims**

1. The method of rolling a metal wire for producing a wide, flat metal strip having a width W at least 4.0 times the original diameter D of the metal wire comprising the steps of:

providing an inner roll having a smooth exterior rolling surface and rotatable about a first axis;

providing an outer roll having a smooth interior rolling surface, said outer roll being mounted around said inner roll and being rotatable about a second axis;

said outer roll being rotatable in the same direction as said inner roll and having its axis eccentrically positioned with respect to said first axis for defining a converging throat between said opposed smooth exterior and interior rolling surfaces travelling in the same direction at the same speed toward a region of closest approach between said converging rolling surfaces;

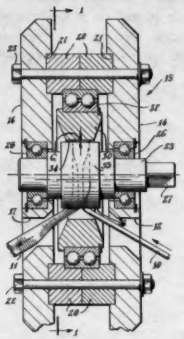
one of said rolling surfaces having a tongue configuration;

the other of said rolling surface having a groove configuration and having an axial width W between the cheeks of said groove;

said tongue rolling surface fitting snuggly into said groove at said region of closest approach;

introducing a metal wire of diameter D longitudinally into said converging throat region;

moving said wire longitudinally through said region of clos-



est approach between said smooth converging tongue and groove rolling surfaces travelling in the same direction;

said region of closest approach between said tongue and groove rolling surface defining a rectangular opening having a cross sectional area which is somewhat less than the original cross sectional area of the wire;

said converging throat defined between said opposed smooth tongue and groove rolling surfaces travelling in the same direction extending for a longitudinal distance of at least 4 D between the point where the wire first contacts the two smooth rolling surfaces and said region of closest approach; and

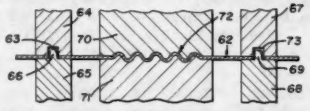
said metal wire being laterally displaced in said converging throat and in said region of closest approach for flattening and widening said metal wire into a wide strip having a width W at least 4.0 times the original diameter D of said wire.

4,233,833

METHOD FOR STRETCHING SHEET METAL AND STRUCTURAL MEMBERS FORMED THEREFROM

Henry A. Balinski, Hoffman Estates, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,619
Int. Cl.[3] B21D *13/04, 13/02, 47/02*
U.S. Cl. 72—180 **2 Claims**



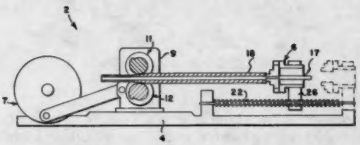
1. A method for forming a stud from a metal sheet in strip form while increasing the width of the sheet, which comprises providing a hem at each margin of the sheet substantially perpendicular to said sheet, said hem being of substantial width maintaining said hems in fixed relationship to each other by means of backup rolls and at the same time providing corrugations solely in a limited central area with respect to the width of said sheet while margins at the two edges of said sheet parallel to said corrugations are maintained flat, unstretched and in substantially fixed relationship to each other, thereby causing the metal at said corrugations to be stretched, at least partially reducing the depth of the corrugations by rolling to increase the width of said sheet, and forming said sheet to provide flanges, thereby forming a stud having certain limited areas of reduced thickness and the remainder of said stud of original thickness.

4,233,834

METHOD AND APPARATUS FOR PRODUCING ZIRCALOY TUBES AND ZIRCALOY TUBES THUS PRODUCED

Ulf A. Matinlassi, Kennewick, Wash., assignor to Sandvik Special Metal Corporation, Kennewick, Wash.

Continuation-in-part of Ser. No. 789,334, Apr. 20, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,757
Int. Cl.[2] B21B *17/06, 21/00*
U.S. Cl. 72—208 **5 Claims**



1. In a method of producting a metal-working pass upon a substantially cylindrical zircaloy reactor tube which includes the steps of, mounting a mandrel within a tubular zircaloy workpiece wherein the mandrel presents an outside cylindrical surface substantially mating with the internal surface of the workpiece with one end of the workpiece being positioned initially adjacent a work zone and in axial alignment therewith, moving said workpiece axially through said work zone in a step-by-step manner and turning it a predetermined turning angle about its axis with each step, rocking a pair of rolls with respect of said workpiece with said rolls exerting equal and opposite forces parallel to a plane which extends through the axis of said mandrel and transversely of the axes of said rolls and thereby exerting substantial forces upon primary working surfaces of the workpiece which are oppositely disposed thereon, with the workpiece having transverse working surfaces upon its opposite sides with their centers substantially along a line transverse of said plane, the improvement which comprises, positioning one of said rolls with its center upon one side of said plane and positioning the other of said rolls upon the other side of said plane, and wherein said turning of the workpiece is through a number of degrees which is greater than 35 and which is not divisible into 360, and the further step of restraining each of said rolls from being moved axially by the action of a component of the forces exerted by said rolls.

4,233,835

ELECTROSTATIC DISCHARGE TESTER

C. James Dahn, Chicago, Ill., assignor to Safety Consulting Engineers Inc., Rosemont, Ill.

Filed Apr. 23, 1979, Ser. No. 32,699
Int. Cl.[3] G01N *33/22*
U.S. Cl. 73—35 **8 Claims**

1. A test apparatus for determining the sensitivity of a substance to electrostatic discharge, comprising:

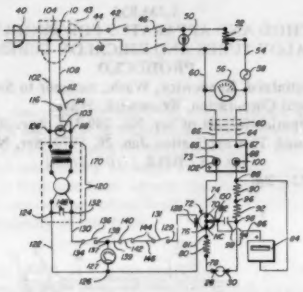
ignition electrode means including a pair of elongated generally cylindrical spark electrodes, and means for mounting said spart electrodes with respective end portions dis-

posed in a spaced relationship defining a spark gap therebetween;

activate means including output circuit means for storing electrical energy and energizing means for supplying energy to said output circuit means;

actuating means including switching means operable when enabled to connect said output circuit means to said spark electrodes to transfer the energy stored by said output circuit means to said electrodes whereby a high energy spark is generated in the gap between said electrodes;

and support means for positioning a sample of the substance adjacent to said spark electrodes to permit the sample to be subjected to the high energy spark generated in the gap,



said support means comprising a hollow tubular member having an internal diameter of a fraction of an inch larger than the outside diameters of said electrodes, permitting the tubular member to be mounted on said electrodes with the end portion of one electrode extending through one end of the tubular member and the end portion of the other electrode extending through the opposite end of said tubular member whereby said tubular member is supported by said electrodes with said end portions of said electrodes extending axially therewithin, and said sample being contained within said tubular member and positioned in the spark gap between said electrodes.

4,233,836

KNOCKING DETECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

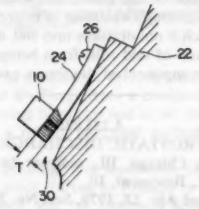
Kenji Yoneda, Fujisawa, and Yasuo Takagi, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 26, 1979, Ser. No. 33,347

Claims priority, application Japan, May 1, 1978, 53-59311[U]

Int. Cl.³ G01L *23/22*; G01M *15/00*

U.S. Cl. 73—35 **6 Claims**



1. A system for detecting the degree of knocking of an internal combustion engine, the system comprising:

a vibration sensing device which is attached to a body of an internal combustion engine and comprises a vibration pickup which has a housing and a seismic mass resiliently held in said housing and is capable of converting mechanical vibrations into electrical signals, and a resonance plate means fixed only in one end region thereof to said body of said engine for mechanically amplifying only those vibrations having a frequency within a band attributable to knocking of said engine, said housing of said vibration pickup being fixedly mounted on said resonance plate in a free end region distant from said one end region, said vibration sensing device, as an assembly of said pickup and said resonance plate, having a resonance frequency within a frequency band of vibrations attributable to knocking of said engine;

reference signal producing means for producing an electrical reference signal which is variable depending on the rate of revolution of said engine; and

signal treatment means for producing an electrical knock-indicating signal which represents the degree of knocking of said engine based on a comparison of an electrical vibration-indication signal derived from said vibration sensing device with said reference signal.

4,233,837

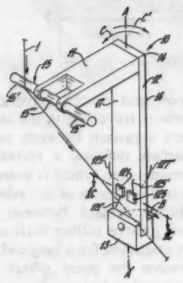
APPARATUS FOR MEASURING TENSION IN A LINEAR MATERIAL

Sheldon A. Canfield, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 8, 1979, Ser. No. 10,442

Int. Cl.³ G01L *5/10*

U.S. Cl. 73—144 **14 Claims**



1. An apparatus for measuring tension in linearly extended flexible material, said apparatus comprising: (a) a support means; (b) a first member having one end attached to said support means; (c) means associated with said first member for engaging tensioned material to impart a bend thereto, thereby causing strain in said first member, said strain being produced by first and second moments, said first and second moments being separate moments; and (d) means for sensing said strain caused in said first member by only said first moment and for generating a signal responsive thereto as an indication of the tension in said material.

4,233,838

LOAD CONTROL FOR TIRE TEST MACHINE

Ariel Stiebel, Bloomfield Hills Township, Oakland County, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Filed May 22, 1979, Ser. No. 41,373

Int. Cl.³ G01M *17/02*

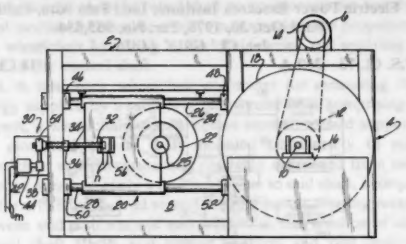
U.S. Cl. 73—146 **12 Claims**

9. In a method for testing tires utilizing a rotating road wheel, movable tire holding means rotatably mounting a tire in loaded engagement with the road wheel, tire loading means, and control means for operating the loading means to thereby control the load on the tire, the steps comprising;

operating the control means to apply a load to said tire;

sensing the load applied to the tire and comparing the applied load with a desired load value;

producing an indication when the applied load differs from the desired load value; and



operating the control means only to reduce the applied load in response to said indication.

4,233,839

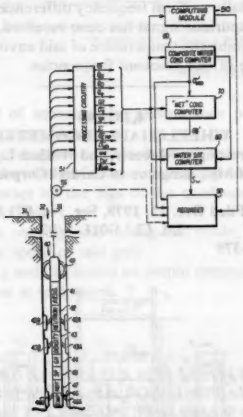
APPARATUS AND METHOD FOR DETERMINING CHARACTERISTICS OF SUBSURFACE FORMATIONS

George R. Coates, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 842,005, Oct. 7, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,186

Int. Cl.[3] E21B *49/00*

U.S. Cl. 73—152 62 Claims



1. Apparatus for determining a composite parameter of the formation water in formations surrounding a borehole, comprising:

means for deriving a first quantity representative of said parameter attributable to the free water in said formations;

means for deriving a second quantity representative of the fraction of bound water in said formations;

means for deriving a third quantity representative of said parameter attributable to the bound water in said formations; and

means for determining said composite parameter as a function of said first, second, and third quantities.

4,233,840

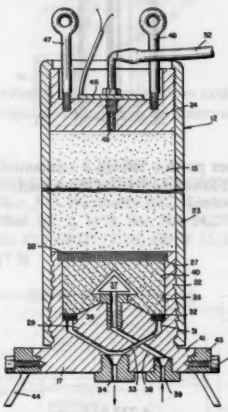
METHOD FOR EVALUATION OF THE RESPONSE OF DIFFERENT CORES TO A RECOVERY PROCESS AND APPARATUS THEREFOR

Michael J. Goss, Cochrane, and David A. Redford, Fort Saskatchewan, both of Canada, assignors to Texaco Canada Inc., Calgary, Canada

Filed Apr. 30, 1979, Ser. No. 34,233

Int. Cl.[3] E21B *49/00*

U.S. Cl. 73—153 13 Claims



1. Apparatus for treating a core specimen (13) of substrate which contains an amount of bitumen therein, to separate at least a part of the contained bitumen from the core specimen, which apparatus includes;

enclosure means (16, 21) defining a disconnectable fluid-tight chamber (11) communicated with a source of pressurizing gas (57, 14) for controlling the atmosphere within said chamber (11),

a specimen holder (12) removably positioned within said fluid-tight chamber (11) and having an enclosing sleeve (23) adapted to receive said core specimen (13),

conduit means communicating said specimen holder (12) with a source of a heating fluid for injecting a stream of said heating fluid into the specimen holder, whereby to raise the temperatures of a pressurized specimen (13) and thereby lower the viscosity of bitumen contained in said specimen,

at the lower end of said specimen holder (12) defining a collector (31) to receive bitumen which flows downwardly from said heated specimen (13).

4,233,841

RAINWATER GAUGE

Alan C. Abele, R.D. 2, Box 132, Harmony, Pa. 16037

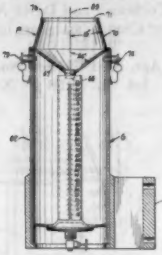
Filed Mar. 8, 1979, Ser. No. 18,737

Int. Cl.[3] G01W *1/14*

U.S. Cl. 73—171 12 Claims

1. A rainwater gauge comprising, an upstanding elongated hollow housing open at the top end, an upstanding elongated hollow rainwater receiving flask open at the top end and disposed interiorly of the housing in spaced relation therein, and a hollow open-ended rainwater receiver funnel disposed on the top end of the housing for collecting rainwater and funneling it into the flask, said funnel having a lower portion having downwardly and inwardly converging walls converging to an outlet opening at the lower end of the funnel at an angle to the funnel vertical centerline of between fifty and fifty-eight degrees, and said funnel having an upper portion connected to said lower portion and having upwardly and inwardly converging walls converging to a rainwater receiving opening of a larger cross-

sectional area than said outlet opening at an angle to the funnel vertical centerline of between twelve and eighteen degrees,



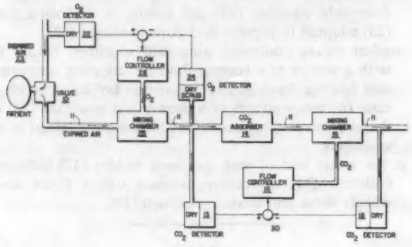
said funnel upper portion having a substantially greater axial height than said lower portion of the funnel.

4,233,842

APPARATUS FOR MEASUREMENT OF EXPIRATION FLUIDS

Daniel B. Raemer; Dietrich K. Gehmlich, and Dwayne R. Westenskow, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Oct. 20, 1978, Ser. No. 953,234
Int. Cl.³ G01F *1/00*; A61B *5/08*
U.S. Cl. 73—861.04 **16 Claims**



1. A dynamic method for determining rate of expiration of a selected fluid constituent in a mixed flow of expired respiration fluids, comprising the recurring steps of:

a. exposing a first sample fraction of the expired fluids to detection means producing a first signal which is a function of concentration of said selected fluid constituent,

b. removing substantially all of said fluid constituent from a second fraction of the expired fluids,

c. exposing said second fraction to detection means producing a second signal which is a function of concentration of the selected fluid constituent,

d. comparing said first and second signals,

e. replenishing said second fraction of expired fluids with resupply of said fluid constituent at a sufficient flow rate to equalize the compared signals of the previous step, and

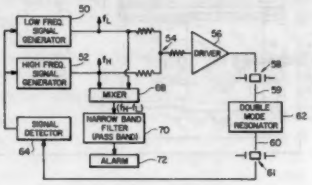
f. monitoring the flow rate to provide data for determining said rate of expiration.

4,233,843

METHOD AND MEANS FOR MEASURING TEMPERATURE USING ACOUSTICAL RESONATORS

John H. Thompson, Severna Park; George F. Gannon, Jr., Chester, and Fred G. Geil, Annapolis, all of Md., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 30, 1978, Ser. No. 955,634
Int. Cl.³ G01K *11/26*
U.S. Cl. 73—339 A **18 Claims**



1. the method of measuring the temperature of an environment by sensing the response of a temperature sensitive acoustical resonator comprising

(a) providing in said environment a temperature sensitive resonator having at least two modes of vibration with a first resonant frequency and a second resonant frequency, said first and second resonant frequencies varying with temperature proportionately with said first frequency and said second frequency having a substantially uniform frequency difference,

(b) applying to said temperature sensitive resonator by waveguide means an acoustical signal including said first and second resonant frequencies,

(c) establishing the frequencies of said first resonant frequency and said second resonant frequency,

(d) comparing the frequency difference of said first resonant frequency and said second resonant frequency with said substantially uniform frequency difference thereby detecting if a spurious signal has been received, and

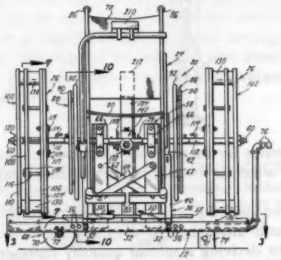
(e) determining the temperature of said environment from at least one of said resonant frequencies.

4,233,844

WHEELCHAIR ERGOMETER

Thomas E. Dreisinger, Moberly, and William L. Carson, Columbia, both of Mo., assignors to Cardrei Corporation, Moberly, Mo.

Filed Dec. 21, 1978, Ser. No. 971,891
Int. Cl.³ G01L *5/02*
U.S. Cl. 73—379 **22 Claims**



1. A device to permit the stationary exercise of a subject by simulating the propulsion of a wheelchair comprising a chair means to support a subject in a sitting position, a support to elevate said chair means and device above its supporting surface, a central shaft rotatably secured to said support, means

secured to said shaft to permit said subject to apply a force to said shaft, means to apply a braking force directly to said shaft to thereby resist rotation of said shaft by said subject, means to measure the force applied by the subject to the shaft, and means secured to said central shaft to compensate for translational inertia whereby the subject may simulate the propulsion of a wheelchair by sitting in the chair means and applying a force to the central shaft.

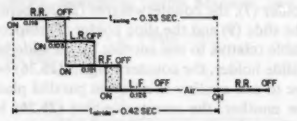
10. A stationary wheelchair ergometer for measuring the energy supplied by a subject in an exercise bout comprising a support, a wheelchair superstructure secured to said support, and elongated central shaft mounted transversely to said wheelchair superstructure and rotatably supported from said support, means to apply a braking torque to said shaft, a torque platform fixedly secured to said braking means, bearing means between said platform and said support so that rotation of said central shaft pivots said torque platform and said braking means, means to measure the angle formed between said torque platform and said support as said shaft is rotated, and means to measure the speed of rotation of said shaft.

4,233,845

METHOD OF ASSESSING PERFORMANCE POTENTIAL OF A QUADRUPED

George W. Pratt, Jr., Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 28, 1978, Ser. No. 928,654
Int. Cl.³ G01D *21/00*
U.S. Cl. 73—432 R **12 Claims**



1. A method of assessing the performance potential of a quadruped, that comprises:

causing the quadruped to move at a high speed gait;

determining the timing of successive making and breaking of ground contact by the legs of the quadruped during its stride in said gait;

measuring the overlap time during said stride;

measuring the speed of said gait;

and producing and displaying an output dependent upon the overlap time at said speed.

4,233,846

METHOD AND APPARATUS FOR MEASURING THE IMBALANCE OF A BOWLING BALL

Wilson G. Taylor, P.O. Box 42517, San Gabriel, Calif. 90050

Filed Jul. 31, 1979, Ser. No. 62,359
Int. Cl.³ G01M *1/04, 1/16*
U.S. Cl. 73—460 **16 Claims**

1. An apparatus for measuring the imbalance of a bowling ball comprising:

a base;

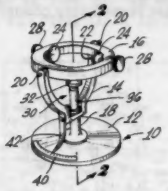
a first gimbal;

means for mounting said first gimbal on said base so as to permit rotation of said first gimbal about a first axis;

a second gimbal;

means for mounting said second gimbal on said first gimbal so as to permit rotation about a second axis perpendicular to said first axis; and

means for rotatably supporting a bowling ball on said second gimbal, whereby said ball can be placed in a desired orientation and rotated while supported by said second gimbal and gyroscopic precession can be observed.

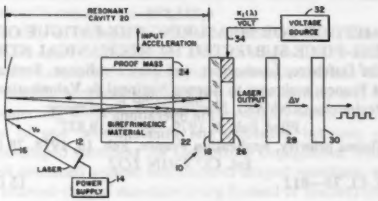


4,233,847

PASSIVE LASER ACCELEROMETER

Clifford G. Walker, 915 Weatherly Rd., Huntsville, Ala. 35803

Filed Jul. 2, 1979, Ser. No. 54,373
Int. Cl.³ G01P *15/08*; G01B *11/18*
U.S. Cl. 73—517 R **8 Claims**



1. A passive laser accelerometer comprising:

(a) first and second reflective members disposed in spaced relation forming a resonant cavity;

(b) a birefringent material having a proof mass thereon disposed in said resonant cavity;

(c) means external of said resonant cavity for generating a beam of coherent light said beam disposed to be reflected back and forth between said reflective members and through said birefringent material, part of said beam disposed for passing through said second reflective member.

(d) means for changing the effective length of said resonant cavity;

(e) detector means for receiving said part of said beam and for providing an output which is a beat frequency proportional to accelerations acting on said accelerometer.

4,233,848

STRAIN GAUGE PRESSURE TRANSDUCER APPARATUS HAVING AN IMPROVED IMPEDANCE BRIDGE

Hideo Sato, Hitachi; Kanji Kawakami, and Motohisa Nishihara, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

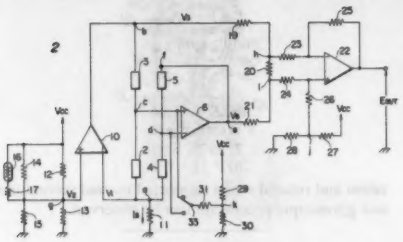
Filed Dec. 20, 1978, Ser. No. 971,358
Claims priority, application Japan, Jan. 6, 1978, 53-160; Jun. 2, 1978, 53-65751
Int. Cl.³ G01L *9/06*
U.S. Cl. 73—727 **10 Claims**

1. A strain gauge pressure transducer apparatus comprising: an impedance bridge having first and second arms, each of which includes two series-connected pressure transducer elements of strain gauges formed on a thin wall semiconductor diaphragm to which a pressure to be detected is applied, first ends of the first and the second arms being electrically connected to each other;

an excitation source, one pole of which is connected to the junction to said first ends of the first and the second arms

of said impedance bridge and the other pole to the other end of the first arm; and

an operational amplifier having non-inverting and inverting inputs which are respectively connected to intermediate



nodes of the first and the second arms of said impedance bridge, the output of the operational amplifier being electrically connected to the other end of the second arm of said impedance bridge.

4,233,849

METHOD FOR MEASURING THE FATIGUE OF A TEST-PIECE SUBJECTED TO MECHANICAL STRESS

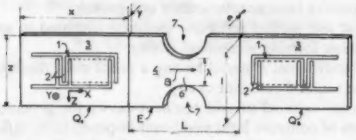
André Defebvre, Lambersart, and Jean Pouliquen, Santes, both of France, assignors to Agence National de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Feb. 6, 1979, Ser. No. 9,827

Claims priority, application France, Feb. 16, 1978, 78 04995

Int. Cl.³ G01N *3/32*

U.S. Cl. 73—812 **13 Claims**



1. A method for measuring the fatigue of a test-piece subjected to stress by measuring the acoustic attenuation of ultrasonic waves, comprising affixing to said test-piece ultrasonic transmitting and receiving means at opposite sides respectively of an area of said test-piece to be stressed, applying stress to the test-piece in said area, propagating ultrasonic pulses of predetermined frequency in an open circuit along the test-piece from said transmitting means to said receiving means at different degrees of stress, measuring the acoustic attenuation of said pulses, and evaluating said attenuation in terms of fatigue.

4,233,850

HAND TOOL

Svante R. Edwardson, Solna, Sweden, assignor to AB Dentatus, Hagersten, Sweden

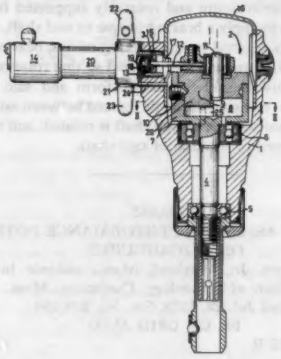
Filed Sep. 7, 1978, Ser. No. 940,363

Claims priority, application Switzerland, Sep. 14, 1977, 102986/77

Int. Cl.³ F16H *21/22*

U.S. Cl. 74—44 **1 Claim**

1. Hand tool, comprising two moving parts, specifically a rotating part (2) and a reciprocating part (3), the latter part (3) being intended to carry a machining tool and receiving its movement from the first-mentioned rotating part (2) via a crank mechanism (11,12) with variable eccentricity for adjusting the length of stroke of the reciprocating part, for this purpose a crank pin (11) in the crank mechanism being eccentrically disposed on a rotatable slide (9) which can be locked fast in various positions, said slide being in turn eccentrically journalled in rotatable slide holder (7) which receives rotating movement from the drive means of the hand tool, characterized in that counterweights (25,26) are disposed in the slide holder (7) and in the slide (9) in order to achieve together a counterbalancing, corresponding to the varying lengths of stroke, of the movements of the reciprocating part (3), said counterweights (25,26) being disposed, upon setting of the crank mechanism (11,12) in order to obtain the desired length of stroke, to either work in conjunction or in opposition, and are therefore rotatable relative to one another to an extent corresponding to the relative movements of the slide (9) and



the slide holder (7), the counterweights (25,26) being securely joined to the slide (9) and the slide holder (7) respectively and being rotatable relative to one another by the slide being rotatable in the slide holder, the counterweights (25,26) being rotatable relative to one another in adjacent parallel planes, which overlap one another, the counterweights (25,26) having the form of semicircular discs, one (26) of which is made as one piece with the slide (9) and is located at the interior end of the same in the slide holder (7), and one (25) of which is located and fastened in the bottom of a space (8) in the slide holder (7) for the slide (9).

4,233,851

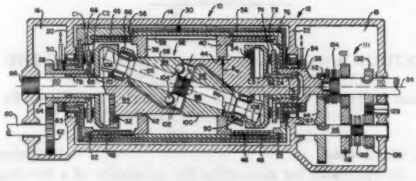
INFINITELY VARIABLE TRANSMISSION UNIT AND METHOD

Yves J. Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Filed May 4, 1979, Ser. No. 36,231

Int. Cl.³ F16H *15/16*

U.S. Cl. 74—191 **28 Claims**



1. In an infinitely variable transmission having a power input, a power output, and means to transmit power from said input to said output including an alpha body concentric with a first axis and rotatably supporting a beta body having a pair of traction surfaces of revolution about a second axis intersecting the first axis at a point of axes intersection, the traction surfaces on the beta body being in engagement on opposite sides of the point of axes intersection with a pair of traction surfaces of

revolution about the first axis and carried on an omega body concentric with the first axis, the radius ratio of traction surfaces on the respective beta and omega bodies varying between minimum and maximum values by axial shifting of the points of traction surface engagement relative to the point of axes intersection, the improvement comprising:

means for connecting said power input with and to impose a driving torque on one of said alpha, beta and omega bodies;

means for retaining another of said bodies against rotation to impose a reaction torque thereon, said driving torque being transmitted through said traction surfaces to impose a driven torque on the remaining one of said three bodies;

means for connecting the remaining one of said bodies to drive said power output; and

means to alternate the imposition of at least two of said driving, reaction and driven torques on at least two of said bodies to provide different ranges of input/output speed ratios, the speed ratios in each such range being variable between range end limits determined by adjustable values of the radius ratio of the traction surfaces.

4,233,852

MECHANICAL POWER TRANSMISSION SYSTEM

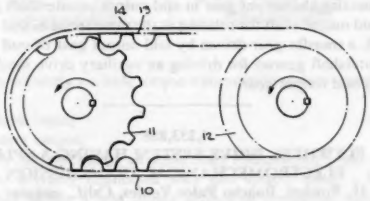
James A. Bruns, Itasca Pengilly, Minn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Dec. 8, 1978, Ser. No. 967,768

Claims priority, application United Kingdom, Dec. 14, 1977, 51992/77

Int. Cl.³ F16H *7/02*

U.S. Cl. 474—153 **39 Claims**



1. A pulley for use with a flexible drive belt which has a plurality of teeth, the pulley comprising a plurality of teeth separated by grooves, each pulley groove being symmetrical about its radial center-line and having a substantially U-shaped longitudinal cross-section comprising first and second non-intersecting curved lines defining parts of opposed flanks of the groove, each curved line being, or approximating to, an arc of a circle drawn from a center lying within the area of the groove, and extending to a height that is at least 25% of the depth of the groove, a first connecting line connecting the first and second curved lines and defining the base of the groove, a second connecting line connecting the first curved line to the tip of a first adjacent tooth and a third connecting line connecting the second curved line to the tip of a second adjacent tooth, each tooth tip, when seen in longitudinal cross-section, comprises third and fourth non-intersecting curved lines joined respectively to the second connecting line of one groove and the third connecting line of an adjacent groove, each of the third and fourth curved lines being, or approximating to, an arc of a circle, and a fourth connecting line connecting the third and fourth curved lines, the length of the fourth connecting line is from 2% to 100% of the width of the belt tooth on the belt with which the pulley is to be used.

4,233,853

BELT PULLEY

William G. Holz, 207 W. Vine, Lodi, Calif. 95240

Filed Oct. 16, 1978, Ser. No. 951,680

Int. Cl.² F16H *55/36, 55/52*

U.S. Cl. 74—185 **10 Claims**

1. A belt pulley comprising:

a shaft;

a plurality of disc-shaped members adapted for coaxial mounting in longitudinally spaced relation on said shaft for rotation therewith and each being formed with a plurality of circumferentially spaced radially outstanding protuberances, each having opposite radially extending circumferentially spaced sides;

a plurality of elongated channel-shaped members having spaced apart side walls and a connecting wall and dimensioned to embrace said protuberances with said side walls in bearing support with said protuberance sides and said connecting walls positioned at the radially outer extremities of said protuberances and extending between said disc-shaped members for supporting engagement with a belt entrained around said channel-shaped members; and

said channel-shaped members being formed of resilient sheet metal with said connecting wall of concavo-convex form, convex outwardly with respect to said side walls and pulley to provide a plurality of substantially circular segments about said shaft.

4,233,854

MOUNTING ARRANGEMENT FOR MOUNTING A PISTON COMPRESSOR ATTACHED AS AN AUXILIARY MACHINE TO AN INTERNAL COMBUSTION ENGINE

Herbert Schleiermacher, Brühl, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 42,880

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1978, 2823992

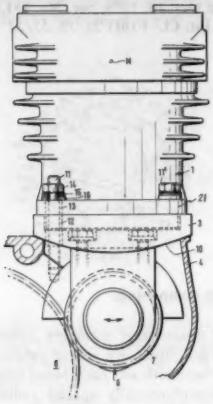
Int. Cl.³ F03B *11/02*

U.S. Cl. 74—325 **6 Claims**

1. A mounting arrangement for mounting a piston compressor to be operatively associated as an auxiliary machine of an internal combustion engine which includes a transmission system and a housing for said transmission system, said piston compressor including an open crank assembly with an extended crankshaft for a gear wheel engageable with a gear of said transmission system, and a mounting flange surface portion, said mounting arrangement comprising:

an intermediate flange member arranged between said mounting flange surface portion and said housing for said transmission system, said intermediate flange member having a flange surface which is directed towards said housing and is axis-parallel with and cylindrically arched toward said gear wheel; and

a matching concave surface portion on said housing, whereby said intermediate flange member is radially mov-



able in the circumferential direction of said flange surface of said intermediate flange member.

4,233,855

MECHANISM FOR THE AXIAL SHIFTING OF AN ANTI-FRICTION BEARING

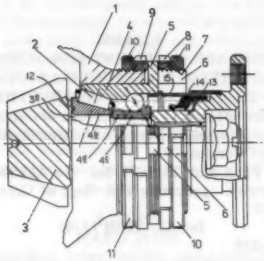
Armin Olschewski; Heinrich Kunkel, both of Schweinfurt; Manfred Brandenstein, Aschfeld, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,654

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726080

Int. Cl.[3] **F16H** *35/06*

U.S. Cl. 74—396 **6 Claims**



1. Mechanism for axially shifting an anti-friction bearing mounted in a bore of a housing extension (1) or the like comprising an annular member (4) mounted in said bore, at least one radially outwardly directed protrusion (5) connected to said annular member projecting through an axially extending slit (6) in said extension (1), the outer peripheral surface of said extension being provided with threads (7) adjacent said slit and two adjusting locking nuts (8, 9) engageable on said thread (7) on opposite sides of said protrusion (5) thereby permitting axial adjustment of said annular member in either axial direction and locking said annular member in a predetermined position against axial displacement in either direction.

4,233,856

Patent Not Issued For This Number

4,233,857

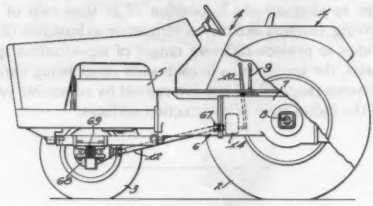
MULTIPLE SPEED TRANSMISSION WITH AUXILIARY TRANSFER DRIVE

David C. Quick, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jun. 2, 1978, Ser. No. 911,779

Int. Cl.[3] **F16H** *37/06*

U.S. Cl. 74—665 GA **10 Claims**



1. A vehicle transmission comprising, an input shaft and an output shaft rotating about a common axis, a countershaft rotating about a parallel axis, an input countershaft gearset connected between said input shaft and said countershaft for driving said countershaft, an output countershaft gearset connected between said countershaft and said output shaft for driving said output shaft device, a clutch for selectively and alternatively engaging a clutch on said output shaft and the countershaft with said output countershaft gearset, means connecting the output gear in said output countershaft gearset to said output shaft for rotating at the same speed as said output shaft, a transfer gear driven by said output gear of said output countershaft gearset for driving an auxiliary drive mechanism from said output gear.

4,233,858

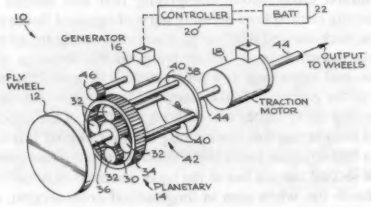
FLYWHEEL DRIVE SYSTEM HAVING A SPLIT ELECTROMECHANICAL TRANSMISSION

Beb H. Rowlett, Rancho Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 27, 1976, Ser. No. 754,597

Int. Cl.[3] **F16H** *37/06;* **B60K** *1/00, 41/04*

U.S. Cl. 74—675 **30 Claims**



1. A combination electromechanical drive system utilizing a flywheel as the principal power source, comprising:

a flywheel mounted for rotation within a housing and having a shaft connected thereto;

a differential planetary transmission having a sun gear, a plurality of planet gears coupled to a carrier, and a ring gear together with first, second and third terminals, the

first terminal being coupled directly to the flywheel shaft;
a first output shaft coupled to the second terminal in a first mechanical power transmission path; and
a second electrical power transmission path comprising first and second motor/generator machines electrically connected together with a controller to control the amount of electric power transmitted thereby, the first machine being mechanically coupled to the planetary transmission third terminal and the second machine having a second output shaft for transmitting rotary mechanical power.

4,233,859

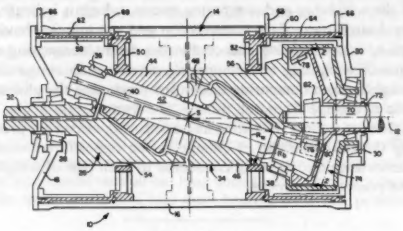
INFINITELY VARIABLE TRANSMISSION UNIT AND SYSTEM INCORPORATING SAME

Yves J. Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Continuation of Ser. No. 955,264, Jul. 31, 1979, abandoned. This application Oct. 1, 1979, Ser. No. 80,221

Int. Cl.³ F16H *37/06*; F16F *15/16*

U.S. Cl. 74—690 **13 Claims**



1. An infinitely variable torque transmission system comprising:
a system input;
a system output;
an I.V. unit including an alpha body rotatable on a first axis and drivably connected with said system input, a beta body having a beta rolling surface of revolution about a second axis, said beta body being carried by said alpha body so that said second axis is inclined with respect to and intersecting said first axis at a point of axes intersection, and an omega body having an omega rolling surface of revolution about said first axis, one of said beta and omega rolling surfaces being of variable radii whereas the other of said rolling surfaces is of relatively constant radius, said rolling surfaces being in frictional engagement at each other at a contact point, means for adjusting the position of said contact point to vary the ratio of said rolling surface radii, a pair of rotatable unit output shafts, first fixed ratio means for combining movement of at least two of said alpha, beta and omega bodies to drive one of said unit output shafts in a first range of unit output speeds for a given system input speed dependent on variation of said ratio of rolling surface radii and second fixed ratio means for combining movement of the same two of said alpha, beta and omega bodies to drive the other of said unit output shafts in a second different range of unit output speeds for said given input speed dependent also on variation of said ratio of rolling surface radii; and
means for alternately coupling one or the other of said unit output shafts to said system output and to provide at least two system ranges of output/input speed ratios.

4,233,860

CONTROL SYSTEM FOR AUTOMOTIVE AUTOMATIC TRANSMISSION WITH EMERGENCY OPERATION FEATURE

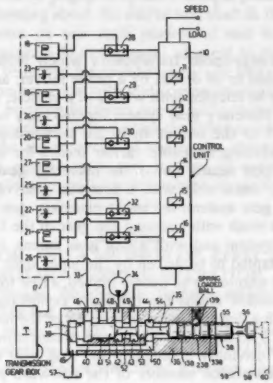
Volker Kadelbach, Freiberg; Gerhard Will, Weinstadt, and Joseph Sauer, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,367

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715553

Int. Cl.³ F16H *3/74*

U.S. Cl. 74—752 A **10 Claims**



1. Control system for an automotive, automatic magnetically controlled gear change transmission (T) and permitting operation of the transmission under emergency condition upon failure of automatic control having
means (34) providing a source of pressurized hydraulic fluid;
a hydraulic servo unit (17) including a plurality of hydraulic servo elements (18–27);
and an automatic control unit (10) including a plurality of electrically controlled valves (11–16), said valves selectively controlling said servo elements upon selective energization of said valves to command engagement of selected gears of the transmission (T) in accordance with selected operation of the controlled valves,
and comprising, in accordance with the invention,
a valve means (35) interposed between the pressure fluid source (34) and the control unit (10) having three positions (58, 59, 60), said valve means controlling application of pressure fluid from said source (34), selectively,
(1) when the valve is in a first position (58) forming the position for normal operation, to the control unit (10), to provide for control of the servo elements by said valves of the control unit,
(2) when the valve is in a second position (59), directly to the servo elements (18, 19, 20, 21, 22) controlling placement of the transmission gear box (T) in "reverse" gear, and
(3) when the valve is in a third position (60), interrupting application of pressurized fluid to the control unit (10) and hence to the servo unit (17) whereby the transmission (T) will be placed in disengaged or "neutral" position.

4,233,861
CHANGE-SPEED TRANSMISSION

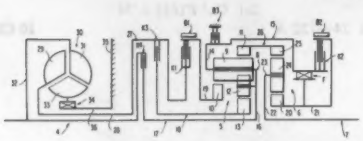
Hermann Gaus, Stuttgart, and Jürgen Pickard, Wernau, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 26, 1979, Ser. No. 23,762

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813223

Int. Cl.³ F16H *57/10*

U.S. Cl. 74—763 **11 Claims**



1. A change-speed transmission which includes an input shaft adapted to be driven by a prime mover, an output shaft adapted to be coupled with wheels of a vehicle, a forward and rearward planetary gear system for drivingly connecting the input shaft to the output shaft, the forward planetary gear system including a double carrier means for mounting two planetary gear means, one of the planetary gear means being adapted to mesh only with a first sun gear of the forward planetary gear system, the other planetary gear means being adapted to mesh with a second sun gear of the forward planetary gear system and with a ring gear means, one of the sun gears is adapted to be driven by the input shaft and the other sun gear is adapted to be fixedly braked, a first torque transmitting connection means for drivingly connecting the carrier means with a first transmission member of the rearward planetary gear system, a second torque transmitting connection means for drivingly connecting the ring gear means with a second transmission member of the rearward planetary gear system, and a change-speed clutch means arranged in one of the torque transmitting means for producing a direct transmission of the rearward planetary gear system, characterized in that the change-speed clutch means is arranged in the first torque transmitting means, a gear shifting clutch means is operatively connected with the carrier means and the input shaft for enabling a driving of the carrier means by the input shaft, the second sun gear of the forward planetary gear system is arranged between the first sun gear and the output shaft, and in that a further gear shifting clutch means is operatively connected with the input shaft and the sun gear for enabling a driving of the second sun gear by the input shaft.

4,233,862
DEVICE FOR SELECTING CHARACTERISTICS OF A TRANSMISSION BETWEEN A MOTOR AND ITS LOAD

Andre M. E. Richard, La Celle-Saint-Cloud, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

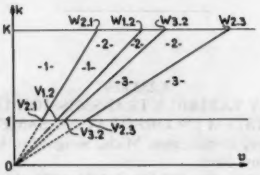
Continuation-in-part of Ser. No. 593,117, Jul. 3, 1975, abandoned. This application Jun. 17, 1977, Ser. No. 807,481

Claims priority, application France, Jul. 5, 1974, 74 23394; Jun. 25, 1975, 75 19959

Int. Cl.³ B60K *41/04*

U.S. Cl. 74—866 **15 Claims**

1. A device for selecting characteristics of a transmission associated with a motor, in particular for an automobile vehicle, the transmission having an output shaft and permitting a plurality of transmission ratios to be selected, the device comprising a generator of electric signals coupled to the output shaft of the transmission and having an output at which output the generator is capable of generating a first alternating signal whose frequency and amplitude are proportional to the speed of the output shaft of the transmission, means having an output for producing from said first alternating signal an additional electric signal whose level is exclusively a function of the load of the motor, said means for producing said additional signal being connected to the output of said generator and comprising a circuit for integrating with respect to time said first alternating signal, means for producing from said first and additional signals characteristics of change between the ratios of the transmission, means connected to the outputs of the generator and of the means for producing said additional signal, for weighting and comparing said first signal and said additional signal and having outputs at which outputs there is produced signals periodically representing the desired state of the transmission, and means for memorizing the desired state of the transmission, connected to said outputs of the weighting



and comparing means, said memorizing means being capable of causing a change from one ratio to a next ratio of the transmission as a function of the said signals produced by said outputs of the weighting and comparing means, which is indicative of the desired state of the transmission said transmission having n ratios, said weighting and comparing means comprising n−1 pairs of weighting and comparing circuits each comprising a weighting and comparing circuit for producing the characteristic of change from one ratio of the transmission to the next higher ratio and a weighting and comparing circuit for producing the characteristic of change in the opposite direction, a memorizing circuit being connected to each pair of weighting and comparing circuits.

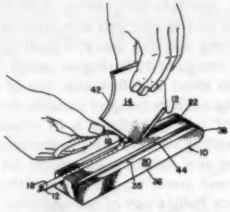
4,233,863
FOIL APPLICATOR TOOL

William C. Cooper, and Alberto A. Garcia, both of Seattle, Wash., assignors to Linda F. O'Brien, Seattle, Wash.

Filed Jun. 13, 1978, Ser. No. 915,276

Int. Cl.³ B31F *1/00*; B25B *27/00*

U.S. Cl. 81—3 R **3 Claims**



1. A foil applicator tool for applying foil strip to the marginal edges of glass panels comprising a body having a substantially planar surface and an adjacent curved surface and having an elongated groove including means for receiving and supporting the foil strip in an unfolded condition which forms an upper portion of the groove and means for closely receiving the marginal edge of the glass panel and foil about the panel edge which forms a lower portion of the groove which is narrower than the upper portion and wherein the body defines the groove such that it extends over the planar surface in a parellel relation thereto and the curved surface following the curvature thereof.

4,233,864

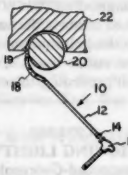
UPPER MAIN BEARING REMOVAL TOOL

Abel Gutierrez, Jr., 169 Dolores St., Oswego, Ill. 60543

Continuation of Ser. No. 776,310, Mar. 10, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 950,989

Int. Cl.[3] B25B *27/14*

U.S. Cl. 81—3 R 11 Claims



1. A tool for removal of an upper main bearing of an engine from a position between an external cylindrical crankshaft surface and an internal semi-cylindrical engine block surface, comprising: a straight elongated handle section and an arcuate blade section integrally secured at one end to one end of said handle section, said blade section extending from said one end thereof to an opposite free end having a flat face for engagement with one end of said upper main bearing, said handle section extending from said one end thereof to an opposite free end having a flat face for application of tapping forces by an impact tool, said flat face of said free end of said blade section being engageable with one edge of said upper main bearing while tapping forces are applied to said flat face of said free end of said handle section with the tapping forces being transmitted through said tool to said main bearing, said blade section being substantially rigid but relatively thin and having an arcuate length of between 90 and 180 degrees, short enough for effective transmission to said main bearing of impact forces applied from said handle section but long enough for effecting removal of the major portion of said main bearing from said position.

4,233,865

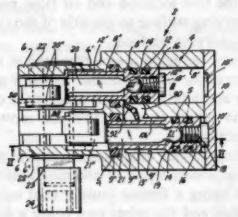
HYDRAULIC WRENCH

John K. Junkers, 7 Arrow Head La., Saddle River, N.J. 07458

Filed Apr. 25, 1979, Ser. No. 35,469

Int. Cl.[3] B25B *13/00*

U.S. Cl. 81—57.44 16 Claims



1. A hydraulic wrench comprising a housing having a main portion and a portion projecting forwardly from said main portion; a pair of parallel cylinder bores in said main portion of said housing, having each an open front end and a closed rear end; a pair of axially displaced piston means respectively mounted in said cylinder bores movable between an active forward stroke and a return stroke, said piston means forming with said closed ends of said bores a pair of compartments; a pair of piston rods, each pivotally connected at one end to a respective one of said pair of piston means; a shaft mounted on said projecting housing portion for rotation about an axis substantially normal to said cylinder bores and transversely spaced therefrom; a pair of ratchet gear means fixed to said shaft for rotation therewith, each of said ratchet gear means having the same number of teeth, with the teeth of one of said ratchet gear means displaced in circumferential direction relative to those of the other ratchet gear means substantially through half a pitch; a pair of drive arms each pivotally mounted at one of the ends thereof on said shaft and pivotally connected at the other end thereof to the other end of a respective one of said piston rods; a pair of pawl means respectively pivotally connected to said drive arms intermediate the ends of the latter and respectively engaging the teeth of said pair of ratchet gear means for rotating said shaft during movement of each of said piston means along its active forward stroke; an exchangeable socket connected to an end portion of said shaft projecting beyond said ratchet gear means mounted thereon for turning a threaded connector engaged in said socket during rotation of said shaft, whereby during such turning of the threaded connector in one direction a force is created tending to turn said housing about the axis of said shaft in the opposite direction; means on said main portion of said housing and adapted to engage a fixed abutment adjacent to the threaded connector to be turned for counteracting said force; and valve means in communication with said compartments for alternatingly feeding pressure fluid into one of said compartments and for discharging pressure fluid from the other compartment so that during the return stroke of one of the piston means the other of said piston means will perform its active forward stroke, whereby said shaft is continuously rotated.

4,233,866

TOOL FOR, AND A METHOD OF, EFFECTING A ROTARY TURNING OPERATION

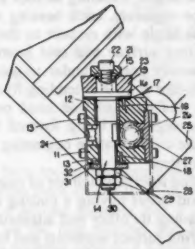
Roland M. Thomas, Birmingham, England, assignor to Lucas Industries Limited, Brimingham, England

Continuation of Ser. No. 831,926, Sep. 9, 1977, abandoned. This application Apr. 24, 1979, Ser. No. 32,734

Claims priority, application United Kingdom, Sep. 21, 1976, 39027/76

Int. Cl.[2] B23B *1/00, 3/00*

U.S. Cl. 82—1 C 4 Claims



1. A tool for effecting a rotary turning operation on a rotatably driven workpiece, comprising a tool carrier, a spindle supported by the carrier for rotational movement about the axis of the spindle, a tool tip engagable with the rotating surface of the workpiece to remove material therefrom, clamping means rigidly securing the tool tip at one end of the spindle, means for applying an adjustable force between the spindle and the carrier including a thrust bearing between the spindle and the carrier, said adjustable force preventing the spindle being, in use, rotated about its axis by the frictional torque imparted to the tool tip by the rotating workpiece, a separate drive mechanism for the spindle, and means connecting the spindle to said separate drive mechanism to positively drive said spindle against said force and rotate said spindle about its axis relative to the carrier; said force applying means includes a screw-threaded member engaged with a complementarily screw-threaded portion of the spindle and movable to urge respective

portions of the spindle and the carrier axially towards each other to compress said thrust bearing.

3. A method of effecting a rotary turning operation on a rotatably driven workpiece having an axis of rotation, the method comprising the steps of urging a tool tip having an axis of rotation against the rotating surface of the workpiece, said tool tip axis of rotation being at an oblique angle relative to the axis of rotation of the workpiece, exerting a restraining force on the tool tip sufficient to prevent the tool tip being rotated by the frictional torque imparted thereto by the rotating workpiece, and at the time positively driving said tool tip at a rotational speed below the speed at which the tip would be rotated by the workpiece in the absence of said restraining force.

4,233,867

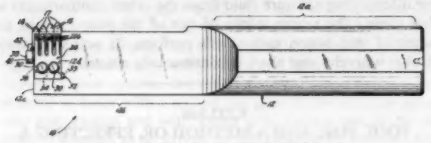
MULTIPLE INSERT TOOL ASSEMBLY FOR THREADING, GROOVING AND THE LIKE

William R. Zimmerman, Califon, N.J., assignor to General Electric Company, Detroit, Mich.

Filed Dec. 5, 1978, Ser. No. 966,573

Int. Cl.³ B23B *29/00*; B23G *1/00*; B26D *1/12*

U.S. Cl. 82—36 R **8 Claims**



1. A tool assembly for machine tools, such as lathes and the like, for forming a helical thread or a groove on a workpiece, particularly on the interior surface of a hollow workpiece, which comprises:

a generally elongate shank having a head portion formed at one end and a butt portion at its other end for mounting to the machine tool, the head portion of said shank being formed with a notch-like cut-out providing an abutment surface extending generally perpendicular to the longitudinal axis of the shank, a seating surface and a plurality of bearing surface segments, each bearing surface segment extending at an angle with respect to the seating surface while said seating surface and said bearing surface segments are generally perpendicular to said abutment surface, said notch-like cut-out extending from said abutment surface to the end edge of said head portion, and said bearing surface segments being formed in generally ascending step-like configuration beginning at the end edge of said head portion;

a plurality of cutting inserts which are of essentially the same length, each said insert having a cutting edge on at least one end and having its other end adapted to bear against one of said bearing surface segments and having its bottom surface adapted to be supported by said seating surface during operation of the machine tool;

a first clamp member adapted to be secured to said shank, said first clamp member having a plurality of clamping fingers, said plurality of clamping fingers corresponding in number to the number of said bearing surface segments, said clamping fingers adapted to hold said inserts against said seating surface during operation of the machine tool when said first clamping member is secured to said shank;

first fastening means for tighteningly securing said first clamp member to said shank to hold said cutter inserts securely in place during operation of the machine tool;

an end clamp member adapted to be mounted to the end edge of said shank at the head thereof, said end clamp member including at least one finger-like member adapted to clamp all the cutting inserts against said abutment surface when said end clamp member is secured to said shank;

second fastening means for tighteningly securing said end clamp member to said shank to hold said cutter inerts in place during operation of the machine tool,

each said cutter insert being mounted to said shank with an end abutting a said bearing surface segment and oriented to extend essentially perpendicular to the longitudinal axis of the shank, the cutting edge of each said cutter insert projecting beyond an edge of said shank defined along said seating surface and all said cutting edges generally defining a line which forms an acute angle with the longitudinal axis of said shank, the cutting edge of the first insert to contact the workpiece being spaced the least distance from the longitudinal axis of the shank, such that as each successive cutter insert contacts the workpiece, the groove cut by each preceding insert is enlarged.

4,233,868

APPARATUS FOR MOVING LIGHTWEIGHT ARTICLES

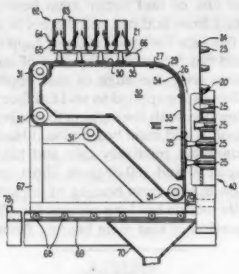
Wolfgang Heni, Schlangenbad-Georgenborn, and Peter Wolf, Wiesbaden-Biebrich, both of Fed. Rep. of Germany, assignors to Bellaplast GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 11, 1979, Ser. No. 47,636

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1979, 2905619

Int. Cl.³ B21D *45/02*; B26F *1/38*

U.S. Cl. 83—126 **24 Claims**



22. Apparatus for moving lightweight articles in the form of containers from a first location to a second location comprising:

(a) an endless conveyor moveable continuously past the first location, and having an article carrying surface directed towards the first location and air flow passages from the article carrying surface to the side of the conveyor remote from the carrying surface;

(b) air pressure reducing means disposed at said remote side of the conveyor and operable to draw air through the conveyor and hold containers against the carrying surface by suction effect as the conveyor moves towards the second location;

(c) a severing device disposed in the first location, said device comprising a pair of coacting cutting tools, one of said tools being a female cutting tool having an annular cutting edge and the other tool being a male cutting tool moveable on a cutting stroke towards the carrying surface and through the female cutting tool to sever containers at their rims from a length of material with which they are integral, the male cutting tool being annular so as to move along and surround the side wall of a container located in the first location as the male cutting tool moves towards the female cutting tool in its cutting stroke;

(d) an article guide extending from the female cutting tool towards the carrying surface and defining an article guide passage for guiding a container as it is moved from the first location to the carrying surface; and

(e) an article ejector pin moveable on a working stroke towards the carrying surface while trailing the male cutting tool moving on its working stroke, the ejector pin

continuing its working stroke after the completion of the cutting stroke to pass through the annular male cutting tool and engage a surface of a closed end of a severed container and transfer the container to the carrying surface, the ejector pin then being moveable on a return stroke preparatory to a succeeding working stroke.

4,233,869

APPARATUS FOR SLITTING WEBS OF MATERIAL

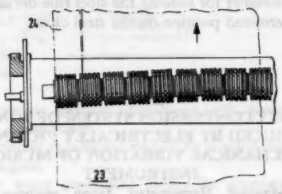
Rolf Meyer, and Herbert Schonmeier, both of Dusseldorf, Fed. Rep. of Germany, assignors to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 6, 1979, Ser. No. 46,404

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1978, 2824900

Int. Cl.³ B26D *7/26*; B23D *19/06*

U.S. Cl. 83—500 **8 Claims**



1. In an apparatus for the longitudinal cutting of webs of material into individual strips, having a plurality of cutting pairs consisting of a lower cutter and an upper cutter and disposed side by side, and means for spreading the meterial on its width and for the spreading apart of the strips of the material, after cutting, the improvement wherein the means for spreading solely comprises means mounting the cutter pairs to be disposed in an arc along the direction perpendicular to the direction of travel of the webs and for the tilting movement of the cutter pairs into the plane of movement of the web of material.

4,233,870

SHEARING MACHINE FOR SEVERING PARALLEL LONGITUDINAL MEMBERS OF GRIDS OR GRATINGS

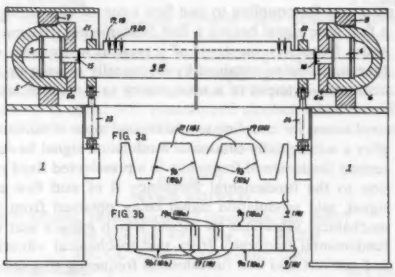
Hans Gött; Josef Ritter; Klaus Ritter, and Gerhard Ritter, all of Graz, Austria, assignors to EVG Entwickoungs-Gesellschaft mbH, Graz, Austria

Filed Dec. 7, 1978, Ser. No. 967,410

Claims priority, application Austria, Mar. 2, 1978, 1505/78

Int. Cl.³ B23D *15/02*

U.S. Cl. 83—563 **6 Claims**



1. In a shearing machine including a machine frame, for severing parallel longitudinal members of grids or gratings, said machine having a horizontal guide-beam which is stationary during the cut and upon which are provided counterbutts in the manner of comb teeth; and a cutter-beam which is movable parallel to and alongside said guide-beam during the cut and upon which blades are provided in the manner of comb teeth, said blades cooperating with said counterbutts on said guide-beam to shear longitudinal members extending through notches formed between adjacent counterbutts of said guide-beam and between adjacent blades of said cutter-beam, the improvement comprising means guiding said guide-beam and said cutter-beam in said machine frame for vertical movement into and out of a working position and associating said guide-beam and said cutter-beam for common vertical motion; two end faces on said guide-beam and a respective stop-face provided opposite to each of said guide-beam end faces; two end faces of said cutter-beam and a respective single-acting fluid pressure-operated cylinder fixed in said machine frame opposite to each of said cutter-beam end faces, each of said cylinders having a piston with a piston rod formed at its end as a thrust face for the respective cutter-beam end face for imparting to said cutter-beam a stroke parallel to said guide-beam and away from that cylinder to which fluid pressure is applied at that time.

4,233,871

NOTCHING TOOL

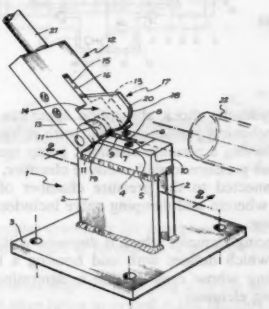
Anthony A. Alessi, 429 West Botany St., Kogarah, N.S.W. 2217, Australia

Filed Aug. 14, 1978, Ser. No. 933,418

Claims priority, application Australia, Apr. 26, 1978, 4172/78

Int. Cl.³ B23D *17/08, 21/00, 27/00*; B26D *3/14*

U.S. Cl. 83—607 **7 Claims**



1. A pipe notching tool to produce a notch extending longitudinally of the pipe from an end thereof, said tool comprising a first member, a second member and a pivot pin pivotally connecting lugs on the first member and holes in the second member, the first member including a base affixed to a column and means for removably mounting a female blade on the first member, a uniform width slot in the female blade extending away from the pivot pin and having two shearing sides and a shearing end remote from the pivot pin, a head affixed to the column, said head containing the lugs, said lugs provided with aligned pivot pin holes, the second member further including a blade holder having aligned pivot pin holes, and means for removably securing a male blade in a slot in the holder said blade being positionable to enter the end of a pipe to be notched, said male blade being aligned with the slot of the female blade so as to enter therein on a closing relative pivotal movement between the first and second members to cause a shearing action between opposed corners of a shearing edge of the male blade and the shearing sides of the female blade slot and a shearing action between a trailing end of the male blade and the shearing end of the female blade slot, said shearing edge of said male blade being convexly curved with the convex curve extending from a leading end of the male shearing

edge to said trailing end of the male blade, the leading end of the male blade shearing edge being spaced from the female blade by an amount at least equal to the thickness of the wall of the pipe to be notched to permit the pipe wall to pass between the female blade and the leading end of the male blade shearing edge when the first and second members are pivoted to an open pipe-receiving relationship, and means for causing the male blade to initially contact the pipe to be notched in a direction substantially perpendicular to the surface of the pipe.

4,233,872

HYDRAULIC SHOCK ABSORPTION IN PUNCH OR CUTTING PRESSES

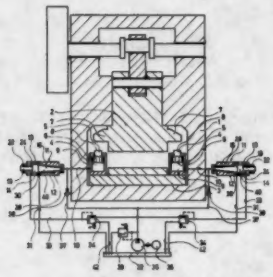
Eckehart Schulze, Weissach-Flacht, Fed. Rep. of Germany, assignor to Firma Hartman & Lämmle GmbH & Co. KG, Rutesheim, Fed. Rep. of Germany

Filed Oct. 23, 1978, Ser. No. 953,384

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748145

Int. Cl.³ B30B *15/00*

U.S. Cl. 83—617 **17 Claims**



1. A hydraulic shock absorption apparatus for cutting or punch mechanical presses provided with at least one damping cylinder having a pressure chamber, pump means for supplying a preset pressure to said pressure chamber, and a damping valve connected to the pressure chamber of said damping cylinder, wherein said damping valve includes:

a housing;

a displacing element, which is disposed within said housing and which defines with said housing a throttle gap or opening whose cross-section is determined by said displacing element;

throttle gap increasing means for subjecting said displacing element to a pressure-dependent load which acts in a direction to increase said throttle gap cross-section; and

throttle gap decreasing means for subjecting said displacing element to a counter-pressure load which acts in another opposite direction to decrease said throttle gap cross section;

whereby said throttle gap is adjusted in dependence on pressure.

4,233,873

PERMANENT MAGNETIC HOLD DOWN FOR STEEL RULE DIES

Kenneth C. Jessen, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 6, 1978, Ser. No. 957,953

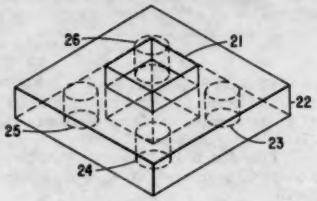
Int. Cl.³ B26F *1/44*; B26D *7/26*

U.S. Cl. 83—652 **3 Claims**

1. A steel rule die assembly for attachment to a steel chase, the steel rule die assembly comprising:

a generally flat non-magnetic die board member having top and bottom surfaces;

a steel rule blade embedded in the die board member, the steel rule blade being embedded perpendicular to the top surface of the die board member such that a cutting edge of the steel rule blade partially extends from the top surface of the die board member to define a die cut pattern; and



a permanent magnet member fixedly attached to the die board member for holding the steel rule die assembly in a predetermined position on the steel chase.

4,233,874

FREQUENCY CONVERSION SYSTEM OF TONE SIGNAL PRODUCED BY ELECTRICALLY PICKING UP MECHANICAL VIBRATION OF MUSICAL INSTRUMENT

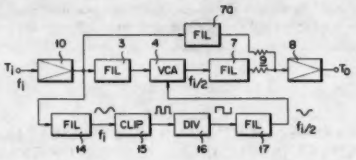
Rokurota Mantani, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 20, 1979, Ser. No. 22,104

Claims priority, application Japan, Mar. 25, 1978, 53-34539; Mar. 25, 1978, 53-34540; Mar. 25, 1978, 53-34541; Mar. 25, 1978, 53-34542; Jun. 13, 1978, 53-71270

Int. Cl.³ G10H *1/06*; H03C *1/00*; H03B *21/00*

U.S. Cl. 84—1.23 **16 Claims**



1. A frequency conversion system for converting a tone signal in octave, comprising:

a multiplier having first and second inputs and an output for providing an output signal at said output which is representative of the product of input signals at said first and second inputs;

first means for coupling to said first input of said multiplier a first tone signal having a first fundamental frequency fi and a frequency spectrum of a musical instrument, said tone signal being obtained by electrically picking up mechanical vibrations of a tone source in a musical instrument; and

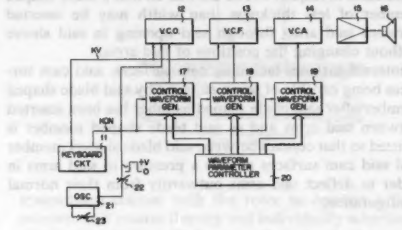
second means for coupling to said second input of said multiplier a substantially sinusoidal modulation signal having a second fundamental frequency in a preselected fixed relation to the fundamental frequency fi of said first tone signal, said modulation signal being obtained from said mechanical vibrations by means which extract said first fundamental frequency from said mechanical vibrations and convert said first fundamental frequency to a sinusoidal wave of said second fundamental frequency,

whereby the output signal obtained at the output of said multiplier has a fundamental frequency of m/nfi (m, n=natural numbers).

4,233,875
ELECTRONIC MUSICAL INSTRUMENT WITH AUTOMATIC TRILL PERFORMANCE FUNCTION

Takeshi Adachi; Masahiko Koike, and Toshiyuki Takahashi, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 6, 1978, Ser. No. 939,954
Claims priority, application Japan, Sep. 8, 1977, 52-108279
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.24 **8 Claims**



1. An electronic musical instrument with automatic trill performance, comprising:

keyboard circuit means for providing a pitch determining voltage signal;

rectangular wave generating means for generating a trill controlling rectangular wave voltage signal having a predetermined frequency; and

a voltage-controlled frequency-variable oscillator coupled to said keyboard circuit means and to said rectangular wave generating means and responsive to application of the pitch determining voltage signal and the rectangular wave voltage signal thereto to produce an automatic trill performance by automatically alternately generating first and second tone signals corresponding to respective notes of a musical scale, said first and second tone signals alternating at said predetermined frequency, the tone pitch of said first tone signal being a function of the magnitude of the pitch determining voltage signal, and the tone pitch of said second tone signal being a function of the magnitude of the rectangular wave signal and the magnitude of the pitch determining voltage signal.

4,233,876
METHOD FOR PREVENTING FREEZE-UP OF MUSICAL INSTRUMENT VALVES AND OTHER MOVABLE ELEMENTS

Thomas Leahy, Box 269C, R.R. 1, Breese, Ill. 62230, and John Fenoli, P.O. Box 49, Aviston, Ill. 62216

Filed Jul. 27, 1978, Ser. No. 928,356
Int. Cl.³ G10D *9/04*; C10M *1/22*
U.S. Cl. 84—388 **5 Claims**

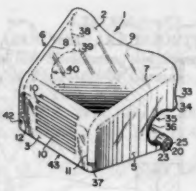
1. A method of lubricating movable valve elements in brass, woodwind, and similar musical instruments and for preventing said elements from sticking or becoming sluggish when the temperature falls below 32° F. by applying a solution comprising by volume about 27% to about 37% polyhydric alcohol, about 43% to about 53% monohydric alcohol, and about 18% to about 22% water to said elements.

4,233,877
WIND SHIELD

Alvin S. Okami, 1915 Huina St., Honolulu, Hi. 96817

Filed Aug. 24, 1979, Ser. No. 69,393
Int. Cl.³ G10D *9/00*; G10G *7/00*
U.S. Cl. 84—453 **10 Claims**

1. A wind shield for a flute-type instrument comprising a top member, a front member, a bottom member, a left plate, and a right plate; the top member is joined to the front member by a bend; the front member is joined to the bottom member by a bend; left and right plates are secured to the sides of the top and front members; bottom member has a vent opening near its juncture with the front member; the left and right plates each have a facing edge and a holding portion; the facing edges of the left and right plates and the free end of the top member are shaped to provide a comfortable fit when the wind shield is



placed against the face of a flutist; the left and right plates are spaced at a preselected distance from the embouchure hole plate of a flute; holding portions of the left and right plates have a diameter which will accommodate the barrel of a flute in a snug and comfortable fit; and means to retain the barrel of a flute within the holding portions.

4,233,878
BARB AND METHOD OF MAKING SAME

Hugh K. McGauran, Harlow, and Leonard Saunders, Hatfield, both of England, assignors to Aerpat A.G., Zug, Switzerland

Filed Jul. 25, 1978, Ser. No. 927,912
Claims priority, application United Kingdom, Jul. 29, 1977, 31939/77
Int. Cl.² F16B *19/00*
U.S. Cl. 85—7 **14 Claims**

1. A barb of circular symmetry for engagement with deformable material, which barb is formed by a rolling process and comprises:

a radially outermost edge for engaging with the deformable material, the edge being provided at the junction of a first face and a second face, the first face being relatively more steeply sloping than the second face;

a trough adjacent the aforesaid first face;

the trough containing an abutment projecting from the aforesaid first face and radially intermediate in position between the radially outermost edge of the barb and the root of the trough.

4,233,879
GROOVED FASTENER

Jerry A. Sigmund, Willow Grove, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

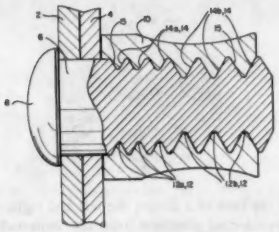
Filed Dec. 26, 1978, Ser. No. 973,334
Int. Cl.³ F16B *19/00, 21/16*
U.S. Cl. 85—7 **6 Claims**

1. A fastener adapted to be connected to a member, comprising:

a head formed to abut the member;

a shank connected to said head at one end thereof and formed to be placed in an opening in the member, said shank including a first section and a second section, said second section having a first group and a second group of a plurality of adjacent grooves therein for forming annular

load bearing surfaces, the depth of said grooves in said first group of grooves being essentially equal and the depth of said grooves in said second group of grooves being essentially equal and the depth of said second group of grooves being greater than the depth of said first group of grooves; and



a collar adapted to be swaged into said grooves so that said load bearing surfaces abut said collar, said collar having an abutting relationship to the member, thereby placing said shank in tension.

4,233,880

STAINLESS STEEL DRILL SCREW

Lowell L. Bjorklund, Elgin; Ramon A. Berg, Roselle, and George A. Friedland, Hampshire, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 20, 1978, Ser. No. 926,185
Int. Cl.[2] F16B *25/00*
U.S. Cl. 85—41 **4 Claims**

1. A corrosive resistant self-drilling and thread-forming screw formed from a 300 series, initially primarily entirely austenitic, stainless steel material, comprising: an elongated shank having a helical thread formed thereon, a radially enlarged driving head at one extremity and a subsequently cold formed drill point at the opposite extremity, the drill point having 40%–70% martensitic structure as a result of point formation while the structure of the head and shank becomes only 10%–40% martensitic structure, providing a fastener with a drill point having at least a surface hardness in the range of Rc 50–58 said hardness being produced without subjecting the screw to elevated temperatures whereby said screw is capable of drilling through steel while retaining the desirable corrosion resistant characteristics of austenitic 300 series stainless steel.

4,233,881

WALL FASTENER STRUCTURE

Vernon J. Carrier, 25830 Viana St., Lomita, Calif. 90717

Filed May 5, 1978, Ser. No. 903,110
Int. Cl.[3] F16B *13/10*
U.S. Cl. 85—81 **3 Claims**

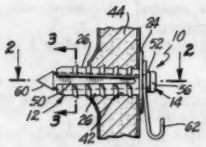
1. A wall fastener structure which includes:

an expansion member including a sleeve having ends and an opening extending therethrough between said ends, a flange extending outwardly from adjacent to one of said ends of said sleeve and two expansion arms extending from the other of said ends of said sleeve,

said arms extending generally parallel to one another, said arms being unattached, said arms having adjacent interior surfaces facing one another which are spaced so as to define a space extending between said arms which is aligned with said opening in said sleeve and extending along the length of said arms, said arms also having external surfaces which are remote from one another,

said internal surfaces being shaped and said arms being positioned in respect to one another so that a blade shaped member of less thickness than width may be inserted between said arms through said opening in said sleeve without changing the positions of said arms,

said internal surfaces including cam surfaces, said cam surfaces being capable of being engaged by said blade shaped member after said blade shaped member has been inserted between said arms and as said blade shaped member is twisted so that contact between said blade shaped member and said cam surfaces applies a pressure to said arms in order to deflect said arms outwardly from their normal configuration,



an expanding member, said expanding member including an elongated shank, a head on one end of said shank which is incapable of fitting through said opening, at least a portion of said shank having a blade like shape which is of less thickness than width, said portion of said shank being said blade like member,

said portion of said shank includes flat sides on said shank which are located so as to be spaced from one another and ridge means located on said shank and extending outwardly from said shank between said flat sides,

said shank includes an elongated ridge means for guiding the insertion of said shank in said expansion member located on one of said flat sides,

said arms include gripping ridges located on said external surfaces so as to extend outwardly therefrom, said gripping ridges being located along the length of said arms,

said internal surfaces include stop means adjacent to said cam surfaces for limiting the amount said blade shaped member can be twisted so that said blade shaped member can only be twisted 90 degrees.

4,233,882

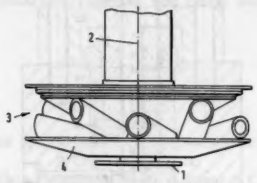
AZIMUTHABLY LAYABLE OR AIMABLE LAUNCHING DEVICE, MORE PARTICULARLY FOR CANISTERS CONTAINING CAMOUFLAGING MEANS OR AGENTS

Kurt Eichweber, Hamburg-Niendorf, Fed. Rep. of Germany, assignor to Precitronic Gesellschaft fur Feinmechanik und Electronic mbH, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 953,091
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1977, 2750776
Int. Cl.[3] F41F *1/00*
U.S. Cl. 89—1 L **10 Claims**

1. A camouflage launching device for camouflaging a station with which the device is associated from an incoming projectile, comprising a stator, a launching rotor rotatably mounted on the stator for rotation about a generally upright axis and having at least one camouflage projectile launching guide adapted to be selectively activated for selectively firing cam-

ouflage projectile outwardly therefrom into a selected azimuth sector, and a fire signal receiver for each launching guide operable for activating the guide, and motor means for rotating the launching rotor about its upright axis to ready the rotor for camouflaging an azimuth sector of the associated station, the stator comprising a transmission detector for detecting an incoming transmission beam from any azimuth angle, the stator having an annular arrangement of a plurality of fire signal



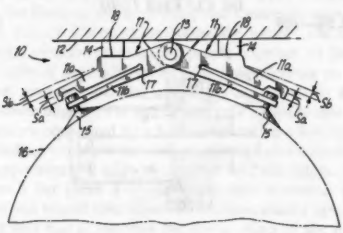
transmitters coaxial with the rotor to operate a fire signal receiver as it rotates thereby and individually selectively operable in accordance with the azimuth angle of a detected incoming transmission beam for selectively operating a fire signal receiver for activating the respective camouflage launching guide for firing a camouflage projectile outwardly into the azimuth sector corresponding to the detected incoming transmission beam.

4,233,883

AUTOMATICALLY SELF-ADJUSTING AND LOAD-LIMITING SWAYBRACE SYSTEM

Richard J. Miko, Paramus, N.J., assignor to Edo Corporation, College Point, N.Y.

Filed Jan. 11, 1979, Ser. No. 2,734
Int. Cl.³ B64D *1/04*; F41F *5/02*
U.S. Cl. 89—1.5 B **14 Claims**



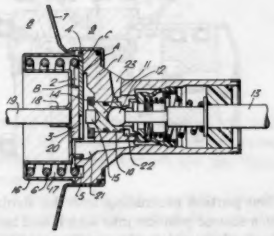
1. An automatically self-adjusting and load-limiting swaybrace system for use in conjunction with stores carried by an aircraft, comprising in combination: at least one pair of opposing swaybrace arms; each arm having means adjacent one end for pivotal connection to aircraft structure; store-contacting means attached to and positioned adjacent the opposite end of each arm; biasing means to be supported by aircraft structure and associated with each arm, for automatically biasing each arm toward the store whereby each store-contacting means maintains contact with the store under no-load, predetermined pre-load and predetermined maximum load conditions at the store-contacting means; each arm having means automatically permitting movement of its store-contacting means toward and away from at least a portion of the adjacent end of said arm through a predetermined distance Sa in operating between the no-load condition and the predetermined pre-load condition at its store-contacting means; each arm having means automatically permitting movement of said at least a portion of the adjacent end of said arm through a predetermined distance Sb in operating between the predetermined pre-load condition and the predetermined maximum load condition at its store-contacting means, said store-contacting means also moving in conjunction therewith through the predetermined distance Sb; and, the distance Sa being equal to the distance Sb; whereby, the predetermined pre-load condition may be automatically obtained and automatically maintained.

4,233,884

VACUUM BRAKE BOOSTER

Rolf Weiler, Frankfurt-Sindlingen, and Peter Böhm, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,470
Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822101
Int. Cl.³ F15B *9/10*; B60T *13/20*
U.S. Cl. 91—369 B **24 Claims**



1. A vacuum brake booster comprising:
a vacuum chamber having a longitudinal axis in which a constant pressure prevails;
a working chamber disposed coaxial of said axis in which different pressures prevail;
a movable wall separating said vacuum chamber and said working chamber;
a control valve supported by said movable wall coaxial of said axis actuated by a brake pedal to control the differentials of pressure acting on said movable wall;
a master cylinder controlling push-rod disposed coaxial of said axis in a force transmitting relation with said movable wall extending into said vacuum chamber;
reaction levers in engagement with said movable wall at a first location and in engagement with said push-rod at a second location, said first location being disposed at a greater radial distance from said axis than said second location; and
a reaction-delaying spring acting on one side of said reaction levers adjacent said vacuum chamber at a third location having a greater radial distance from said axis than said first location.

4,233,885

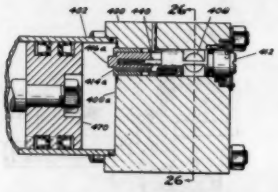
APPARATUS FOR IMPROVED MOTION CONTROL

Richard E. Deschner, 5550 Harcross Dr., Los Angeles, Calif. 90043

Division of Ser. No. 783,006, Mar. 30, 1977, abandoned. This application Oct. 24, 1978, Ser. No. 954,101
Int. Cl.³ F01B *11/02*; F15B *13/04*
U.S. Cl. 91—410 **8 Claims**

1. In combination.
(1) a pneumatic actuator comprising a head structure, a pressure cylinder attached thereto, a reciprocative piston slidably disposed in said pressure cylinder, a mechanical stop means supported by said head structure and positioned to limit the stroke of the piston, said pneumatic actuator being operated by a flow of compressed air, and means comprising a conduit for conveying air under pressure into said cylinder, and

(2) a safety device for preventing excessive impact of said reciprocative piston against said mechanical stop means comprising a normally open valve in said conduit which is responsive to motive power impulses and operative to close and maintain a closed position in response to a motive power pulse, a weighted movable hammer member having first and second positions, first resilient means bearing against said hammer member, an impact receptive element positioned to receive motive power pulses from the second position of said hammer member, said hammer member and said impact receptive element having spaced opposed impact striking surfaces, and means for transmitting motive power pulses from said receptive element to said valve to cause said normally open valve to close, said hammer member having three critical positions, a first position conditionally maintained by said first resilient means bearing against said hammer member and holding



said first portion protruding into the stroke path of said piston, a second position into which said hammer member is forced when said piston contacts said mechanical stop means and a third position in which said second portion of the hammer member strikes said impact receptive element, said hammer member having a structural shape which precludes it from contacting said impact receptive element while disposed in said second position, the force of said resilient means and the weight and shape of said hammer member being correlated to permit said hammer member to move against said first resilient means from said second position to said third position by inertia to close said valve when the impact of said piston against said mechanical stop means and said hammer member exceeds a predetermined safe value; and

(3) means for mounting said safety device on said pneumatic actuator in the stroke path of said piston.

4,233,886

SEALING DEVICE FOR HYDRAULIC PISTON MECHANISM

Lucien D. Balzano, Jouars Pounchar Vrain, and Marc V. A. Lepretre, Bois-Colombes, both of France, assignors to Bertin & Cie, Plaisir, France

Filed Aug. 1, 1978, Ser. No. 930,042

Claims priority, application France, Aug. 1, 1977, 77 23610

Int. Cl.³ F01B *31/10*; F16J *15/40*

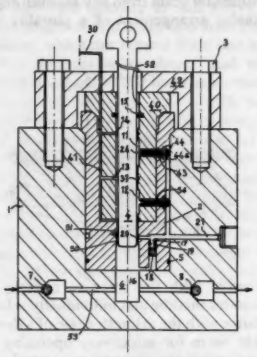
U.S. Cl. 92—86.5 **9 Claims**

1. In hydraulic apparatus of the kind in which a reciprocating piston is slidably fitted with a close clearance gap between it and a cylinder wall designed for forming at an end thereof a high pressure hydraulic chamber located in a hydraulic flow channel for the processing of a first main fluid, the combination comprising,

a further flow channel for the feeding of a second auxiliary viscous fluid distinct from said first main fluid though minglable therewith,

a groove formed on said wall adjacent said high pressure hydraulic chamber and fed from said further flow channel with said second auxiliary viscous fluid to fill said close clearance gap thereby effectively sealing said high pressure hydraulic chamber around said piston, said close clearance gap allowing fluid leakage therethrough thereby permitting said first and second fluids directly to contact each other, and

means in the wall providing a twin hydrostatic bearing system for said piston at a distance from said groove on the side thereof remote from said high pressure hydraulic



chamber, said twin hydrostatic bearing system being fed with said second auxiliary viscous fluid in parallel with said groove and comprising two separate and distinct elemental fluid bearings formed by separate grooves in said cylinder wall spaced lengthwise along said piston.

4,233,887

PISTON-CYLINDER UNIT

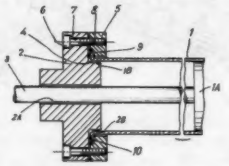
Kurt Stoll, Lenzhalde 72, 7300 Esslingen, N, Fed. Rep. of Germany

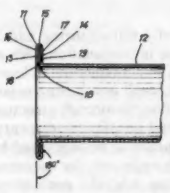
Filed Oct. 18, 1978, Ser. No. 952,602

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1977, 2747676

Int. Cl.³ F16J *11/02*

U.S. Cl. 92—169 **1 Claim**





1. A piston-cylinder unit, comprising:

an elongated and hollow housing having a central opening at one end and a laterally extending flange means at said one end thereof, said flange means consisting of a first portion integral with said housing and extending laterally from said housing and a second portion integral with said first portion extending coextensively parallel to said first portion but spaced axially therefrom, said first and second portions having a 180° angle bead portion therebetween;

releasable end cap means secured to said housing at said one

end thereof, said end cap means including an end cap member engaging a first axially facing surface on said first portion and covering said central opening in said hollow housing at said one end, said end cap means further including an annular collar engaging a second axially facing surface on said second portion, said first and second axially facing surfaces facing in opposite longitudinal directions; and

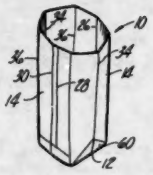
fastener means for securing said end cap member to said annular collar and clamping said flange means therebetween.

4,233,888

METHOD OF MAKING A COLLAPSIBLE DRUM-TYPE CONTAINER

Arthur E. LaFleur, Manistee, Mich., assignor to Custom Packaging Systems, Manistee, Mich.

Filed Nov. 6, 1978, Ser. No. 958,130
Int. Cl.³ B31B *31/60, 1/26*
U.S. Cl. 493—132 **11 Claims**



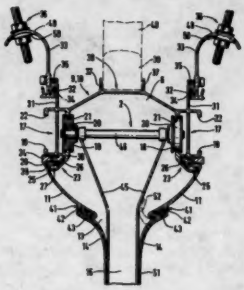
1. The method of making an envelope adapted, when opened, to form a drum-type container having a generally rectangular, flat bottom wall and side walls extending upwardly from the periphery of the bottom wall, comprising, folding a flat blank of self-supporting sheet material upon itself to form a pair of generally overlying flat panels, sealing selected edge portions of said flat panels together to form a flattened tube of generally rectangular shape having an open upper end, generally parallel side edges connected by a fold line and lower edges at the end of said tube opposite said open end which are connected by a fold line, forming a first lengthwise extending score line on each panel throughout the length thereof approximately midway between said side edges, forming on each flat panel a second score line extending transversely of and to said side edges at a location spaced upwardly from said fold line connecting the lower edges of the panels, forming a pair of score lines on each panel which converge upwardly toward each other from points on the second score line spaced equally inwardly from said side edges such that the converging score lines intersect at the first score line, opening the flattened tube by spreading said panels apart, refolding the tube along said first score lines into a refolded flattened tube having a pair of overlying flat side walls and additionally folding the lower portions of said panels upwardly and inwardly along said converging score lines and also along the portions of the first score lines extending below said intersections on each of said panels to form an inwardly folded gusset panel at the lower end of said refolded flattened tube which extends upwardly between the side walls thereof, whereby the upper edge of the folded gusset panel comprises the portions of the first score lines which extend downwardly from said intersections on the initially folded blank and the converging score lines form laterally outwardly and upwardly inclined fold lines connecting the laterally outer edges of the folded gusset panel with the lower corner portions of the flat side walls of the refolded flattened tube.

4,233,889

TRACK FORMING A GAS-THROUGHFLOW DUCT AND PROVIDED WITH A MOVABLE GAS PASSAGE UNIT

Bill P. P. Nederman, Halalid 3, Helsingborg S-252 33, Sweden

Filed Dec. 15, 1978, Ser. No. 970,090
Claims priority, application Sweden, Dec. 16, 1977, 7714340
Int. Cl.³ F23J *15/00*
U.S. Cl. 98—115 VM **15 Claims**



1. A track forming a gas throughflow duct, the track being of the type adapted for guiding a movable gas passage unit therealong in sealing cooperation with the gas throughflow duct, the track comprising:

(a) a plurality of structural girders connected to each other through butt joints by which said girders are disposed in mutually, abutting, end-to-end relationship to form an elongated structural beam;

(b) means for effecting interconnection of said girders to each other in said abutting relationship;

(c) A plurality of lateral sections depending from said girders in spaced pairs, said lateral sections contributing to defining the gas throughflow duct, said lateral sections also defining a lower slot therebetween, each lateral section having an upper side and a lower side, said lateral sections mating with said girders in a connection region, said connecting region being adjacent said upper sides of said lateral sections;

(d) a plurality of interengaging sealing sections coupled with said lateral sections to seal said lower slot, said sealing sections being adapted to sealingly engage the movable gas passage unit and, while maintaining such seal, to allow the gas passage unit to be moved along said beam; said girders, lateral sections, and sealing sections together defining an interior duct passage;

(e) means, in said connecting region, for facilitating and effecting rapid coupling of said lateral sections to said girders;

(f) means, adjacent said lower sides of said lateral sections, for enabling rapid joining of said sealing sections to said lateral sections, said enabling means including catches adjacent said lower sides of said lateral sections; and

(g) said means for effecting interconnection of said girders including said lateral sections, each lateral section extending longitudinally to either side of at least one of said butt joints.

4,233,890

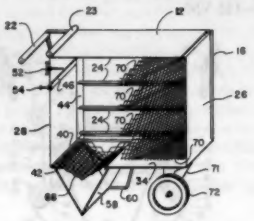
OUTDOOR BAR-B-Q SMOKER AND GRILL

Robert A. Jansen, 3930 Northern Pike, Monroeville, Pa. 15146

Filed Jul. 16, 1979, Ser. No. 57,621
Int. Cl.³ A47J *37/04*
U.S. Cl. 99—340 **7 Claims**

1. A cooking device comprising a generally rectangular

enclosure, an upper sliding cover for said enclosure, an opening in the bottom of the enclosure, means in said opening for burning fuel, a plurality of vertically-spaced guideways extending along opposite sides of said enclosure, and a plurality of cooking racks slideably supported on said guideways and movable from positions where they are directly above said



means for burning fuel to positions where they are not above said means for burning, whereby food can be grilled on the cooking racks directly above said means for burning or can be smoked on racks in positions where they are not above said means for burning.

4,233,891

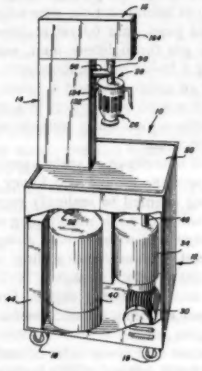
APPARATUS FOR MAKING SCRAMBLED EGGS

James Schindler, Naperville, and Anthony R. Nugarus, Chicago, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Division of Ser. No. 835,644, Sep. 22, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,469

Int. Cl.³ A47J *27/14, 29/00*

U.S. Cl. 99—348 **22 Claims**



1. An apparatus for cooking scrambled eggs in a containerized charge comprising:

a support frame;

a container for holding a charge of uncooked shelled eggs and having a free space expansion above said charge of eggs;

means on said frame for holding said container upright and for introducing a plurality of jets of steam at spaced, stationary locations in the interior of said charge of eggs to disperse said steam therein whereby said charge of eggs is agitated and cooked; and

means for continuously venting said container to allow escape of steam from said container to maintain the interior volume of said container at substantially atmospheric pressure; and

means for terminating the flow of steam in response to a predetermined condition after said charge of eggs is thoroughly and uniformly cooked to a substantially homogeneous scrambled egg mass having an expanded volume and which is light and tender and delectable in appearance and flavor.

4,233,892

SPIT ROASTING APPARATUS AND THE SPIT ROASTING OF ROASTABLE FOODSTUFFS

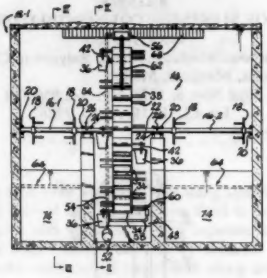
David J. D. Hawkins, Johannesburg, South Africa, assignor to Robin Justice Constance, South Africa

Filed Feb. 26, 1979, Ser. No. 15,066

Claims priority, application South Africa, Mar. 22, 1978, 78/1681

Int. Cl.³ A47J *37/04*

U.S. Cl. 99—421 M **15 Claims**



1. Spit roasting apparatus comprising a spit member for supporting roastable foodstuffs to be roasted, a rotatably supported water wheel for rotatably driving said spit member, said water wheel having a plurality of water-receiving trough formations at spaced intervals along its periphery for receiving water to drive the water wheel and automatic compensating means associated with the water wheel for automatically compensating for eccentricity in the mass distribution of roastable foodstuffs supported on the spit member.

13. Spit roasting apparatus comprising a spit member for supporting rotatable foodstuffs to be roasted, a rotatably supported water wheel for rotatably driving said spit member, said water wheel having a plurality of water-receiving trough formations at spaced intervals along its periphery for receiving water to drive the water wheel, and compensating means for compensating for eccentricity in the mass distribution of roastable foodstuffs supported on the spit member, said compensating means comprising a plurality of compensating buckets which are associated with at least some of the trough formations to receive and store overflow from these trough formations.

4,233,893

BONDING APPARATUS FOR BRAKE LININGS

William L. Pringle, Grosse Pointe Shores, Mich., assignor to Leonard Friedman, Beverly Hills, Calif.

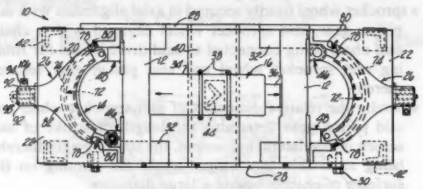
Filed Jul. 6, 1979, Ser. No. 55,454

Int. Cl.³ B30B *15/34*

U.S. Cl. 100—93 PB **10 Claims**

1. An apparatus for bonding brake linings to tables of brake shoes with an application of heat and pressure which comprises; a restrainer member having a cavity constructed and arranged to receive a brake lining therein, said cavity having a generally arcuate wall constructed and arranged to be complimentary with the outer face of a brake lining received in said cavity, a carrier member adapted to be moved toward and away from said cavity of said restrainer member and constructed and arranged to receive and position a brake shoe such that the outer face of the table thereof may be urged into firm engagement with the inner face of a brake lining received in said cavity of said restrainer member, drive means for moving

said carrier member toward and away from said restrainer member to extend and retract the table of a brake shoe carried thereby into and from said cavity of said restrainer member, and a pair of heater units each having at least one heater element and constructed and arranged such that when said carrier member is moved by said drive means to urge the outer face of the table of the brake shoe carried thereby into firm engagement with the inner face of the brake lining received in said



cavity of said restrainer member such heater units can be moved to a first position wherein their heater elements lie behind and closely adjacent the inner face of the table of the brake shoe on opposite sides thereof and to a second position sufficiently distal from said cavity and the brake shoe to permit retraction of said carrier member from said cavity by said drive means and removal of the brake shoe with the liner bonded thereto from said carrier member.

4,233,894

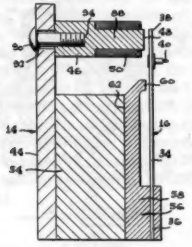
PRINT HAMMER MECHANISM HAVING DUAL POLE PIECES

Gordon B. Barrus, El Segundo, and Jerry Matula, Westminster, both of Calif., assignors to Printronix, Inc., Irvine, Calif.

Filed Jun. 2, 1978, Ser. No. 911,989

Int. Cl.³ B41J *7/70*

U.S. Cl. 101—93.04 **11 Claims**



1. A print hammer mechanism for a dot matrix printer comprising:

a magnetic resilient print hammer element comprising a single elongated, relatively flat strip of resilient material having a relatively small, uniform thickness between opposite broad surfaces and having a fixed end and an opposite free end and including a dot imprinting element extending from one of the broad surfaces of the elongated strip adjacent the free end thereof, the elongated strip being mounted at the fixed end thereof so as to assume a relatively straight configuration defining a neutral position when not flexed;

magnetic circuit means including permanent magnet means and a pair of pole pieces coupled in magnetic circuit with the elongated strip, the pair of pole pieces being disposed adjacent the free end of the elongated strip with one of the pair of pole pieces receiving the other one of the broad surfaces of the elongated strip and the other one of the pair of pole pieces forming an air gap with the other one of the broad surfaces of the elongated strip when the elongated strip is in a spring-loaded retract position in which the strip is flexed out of the neutral position and assumes a curved configuration, and the permanent magnet means establishing a magnetic field normally maintaining the elongated strip in the spring-loaded retract position; and

means coupled to the one of the pair of pole pieces for substantially cancelling the magnetic field in a portion of the magnetic circuit means adjacent the elongated strip to release the elongated strip for flight away from the spring-loaded retract position, the resilient material of the elongated strip combining with the magnetic field of the permanent magnet means to return the strip to the spring-loaded retract position following release of the strip and impact of a printable medium by the dot imprinting element.

4,233,895

PRINTER COMPRISING A PRINTING HEAD WHICH IS ADJUSTABLE BY MEANS OF A MOTOR

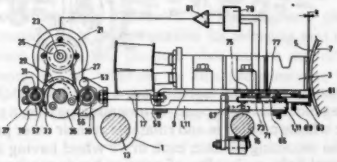
Herbert Wehler, Neunkirchen-Salchendorf, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,455

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1977, 2752061

Int. Cl.³ B41J *3/12, 11/20, 7/92*

U.S. Cl. 101—93.05 **2 Claims**



1. A printer for printing a plurality of characters along a line having a predetermined first direction on an associated record carrier which comprises:

a carriage which is displaceable along the record carrier in a direction which is parallel to said first direction,

a printing head carried on said carriage,

means for mounting said printing head on said carriage which allows said printing head to be displaced with respect to said carriage in a direction which is generally transverse to said first direction,

said means for mounting including a motor which is mounted on said carriage,

means for coupling said motor and said printing head, said means for coupling including first and second cam discs, and a drive shaft coupled to said motor, said first and second cam discs being rigidly mounted on said drive shaft, said means for coupling including first and second cam followers located at diametrically opposite sides of said drive shaft with respect to one another and respectively cooperating with said first and second cams, said first and second cams being of a configuration so that the axes of said first and second cam followers remain disposed at a substantially constant distance one from the other upon rotation of said drive shaft, said means for coupling including a slidable member one end of which is connected to said printing head, said first cam follower being rotatably journalled on the opposite end of said slidable member, said second cam follower being carried on a shaft, said follower shaft being mounted in an aperture in said slidable member with said aperture being dimensioned to provide clearance around said follower shaft, means connected to said slidable member for biasing said second cam follower toward said second cam,

said apparatus including means for controlling the position of said printing head, said means for controlling cooperating with said motor and including means for producing a

signal output for as long as the position of said printing head deviates from a predetermined reference value, said means for producing including a sensor, the position of said sensor being dependent on the thickness of the record carrier, said sensor producing the signal output of said means for controlling for as long as the position of said printing head deviates from a predetermined reference value.

4,233,896

LABEL PRINTING AND APPLYING APPARATUS

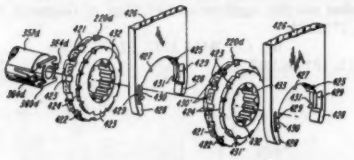
Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 653,405, Jan. 29, 1976, which is a division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Mar. 19, 1979, Ser. No. 21,534

The portion of the term of this patent subsequent to Jul. 13, 1993, has been disclaimed.

Int. Cl.³ B41J *1/22*

U.S. Cl. 101—110 **20 Claims**



1. Printing apparatus, comprising: a print head including a mounting block having a concave mounting surface, a plurality of drive wheels cradled in and rotatable at their outer peripheries on the mounting surface, each drive wheel having a generally central hole, a plurality of printing bands received under tension about the respective drive wheels, a selector adapted to extend into the holes in the drive wheels to engage any selected drive wheel to advance a selected printing band, and spacers disposed between adjacent drive wheels, the spacers having a pair of lugs disposed at the ends of the concave mounting surface.

4,233,897

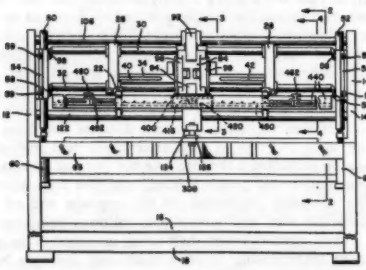
LONG STROKE ATTACHMENT FOR A SCREEN PRINTING MACHINE

Louis A. Lala, Chicago, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Filed Aug. 24, 1978, Ser. No. 936,329

Int. Cl.³ B05C *17/04*

U.S. Cl. 101—123 **3 Claims**



1. A long stroke attachment assembly for use with a screen printing machine for printing on objects of revolution having surfaces of large diameters, said long stroke attachment assembly having a drive means, screen support means and a squeegee support means, each of said screen support means and said squeegee support means engageable with said drive means for reciprocal vertical movement both in concert and relative to one another; said screen support means being capable of causing lateral reciprocal movement of a screen mounted thereto;

a rack member connected to said screen for following lateral reciprocal movement;

a pinion gear mounted for rotation on said screen support means in driving engagement with said rack member;

a sprocket wheel fixedly secured in axial alignment with said pinion gear, said sprocket wheel engaged with a chain, said chain being connected to said drive means for rotating said sprocket wheel and said pinion gear secured thereto;

whereby the relative diameters of said sprocket wheel and said pinion gear determine the length of stroke of said screen in said lateral movement, the stroke length thereby being adjustable to a longer stroke for printing on the surfaces of objects having a large diameter.

4,233,898

REVERSIBLE NEWSPAPER PRESS

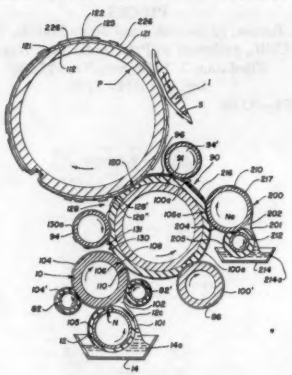
Harold P. Dahlgren, Dallas, Tex., assignor to Dahlgren Manufacturing Company, Dallas, Tex.

Continuation-in-part of Ser. No. 897,262, Apr. 18, 1978. This application Jun. 23, 1978, Ser. No. 918,228

The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.

Int. Cl.³ B41F *7/26, 7/36, 31/06, 31/36*

U.S. Cl. 101—138 **7 Claims**



1. In a web-fed printing press wherein ink is applied to a printing plate on a plate cylinder which transfers an image to liquid receptive material, the improvement comprising: a single form roller having an ink receptive surface; means rotatably supporting said form roller in pressure indented relation with the printing plate; positive drive means connected to said form roller; an ink transfer roller having an oleophillic ink receptive surface; means rotatably supporting said ink transfer roller in pressure indented relation with said form roller; means forming a film of ink on said transfer roller; reversible drive means drivingly connected to said ink transfer roller, said reversible drive means being adapted to permit reversing the direction of rotation of said ink transfer roller upon reversing the direction of rotation of the form roller and the plate cylinder; a pair of ink storage rollers; and means rotatably supporting said ink storage rollers such that the surface of the form roller which is moving from pressure indented relation with the printing plate moves adjacent to one of said ink storage rollers before moving in pressure indented relation with said ink transfer roller upon rotation of the form roller in a clockwise or a counter-clockwise direction.

4,233,899

PREVENTION OF IMPACT IN IMPRESSION CYLINDER OF SHEET-FED LITHOGRAPHIC PRESS

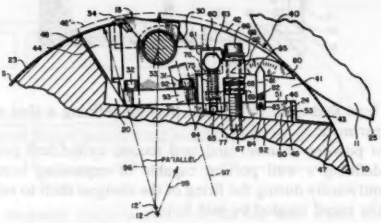
Herbert Rebel, Rodgau, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinenfabrik Faber & Schleicher AG, Fed. Rep. of Germany

Filed Apr. 16, 1979, Ser. No. 30,601

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1978, 2824430

Int. Cl.³ B41F 7/04, 13/18

U.S. Cl. 101—142 12 Claims



1. In a lithographic sheet-fed press having an impression cylinder with a gap in the surface thereof defining the printing area and a cooperating blanket cylinder having bearers at its ends, blankets on the cylinders establishing printing pressure therebetween as the cylinders rotate in engagement with one another, a pair of auxiliary short bearer members arranged to bridge the gap in the impression cylinder, said bearer member presenting arcuate edges alined for engagement with the respective bearers on the blanket cylinder, means for supporting the bearer members at such radial height on the impression cylinder that when the blanket cylinder rolls into the region of the gap on the impression cylinder upon reaching the end of the printing area the force of printing pressure between the cylinders is temporarily taken over by the auxiliary bearer members to achieve a smooth restoration of printing pressure upon reaching the end of the gap and at the beginning of the printing area thereby avoiding the cyclical impact accompanying sudden build-up of printing pressure, the impression cylinder including guiding means for guiding the bearer members in a generally radial direction along precisely parallel paths, and adjusting means for reproducibly adjusting the radial positions of the bearer members to precisely corresponding points along the parallel paths to preserve the smooth restoration of printing pressure upon making a change in the thickness of the sheet stock being printed.

4,233,900

LABEL STRIP CHARGING MECHANISM FOR HAND LABELER

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Aug. 31, 1978, Ser. No. 938,422

Claims priority, application Japan, Sep. 2, 1977, 52-105008

Int. Cl.² B41F 1/08; B65C 9/18, 11/02

U.S. Cl. 101—288 22 Claims

1. A hand labeler, comprising:

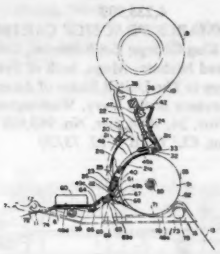
a frame, a printing head carrying types to be printed on a label; a platen opposable to said types; means for moving at least one of said printing head and said platen for bringing said types into engagement with a label on said platen;

a feeding roller supported on said frame for feeding a label strip comprised of a series of labels to said platen; means for rotating said feeding roller;

a label strip charging mechanism located upstream of said platen, with respect to the travel of the label strip through said labeler; said charging mechanism comprising a pressure plate positioned near said feeding roller for defining a passage for the label strip between said pressure plate and said feeding roller; said pressure plate including a portion which is connected to be supported by said frame for movement with respect to said frame;

biasing means connected to said pressure plate for biasing said pressure plate apart from said feeding roller, thereby defining a relatively less restricted passage between said pressure plate and said feeding roller for the label strip;

retaining means for retaining said pressure plate in the vicinity of said feeding roller against the bias of said biasing



means, thereby defining a more restricted passage between said pressure plate and said feeding roller for the label strip;

an actuating lever connected to said pressure plate; said actuating lever being operable for releasing said retaining means so that said pressure plate can be moved by said biasing means, whereby an enlarged clearance between said feeding roller and said pressure plate is formed to facilitate charging of the label strip.

4,233,901

DRYING PRINTED WEB MATERIAL

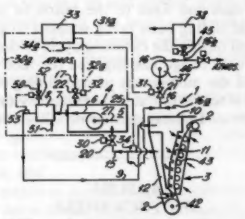
Leonard B. Mallinson, Blackburn, England, assignor to Baker Perkins Holdings, Ltd., Peterborough, England

Filed Jul. 7, 1978, Ser. No. 922,617

Claims priority, application United Kingdom, Nov. 9, 1977, 46538/77

Int. Cl.³ B41F 23/04

U.S. Cl. 101—416 A 8 Claims



1. Apparatus for drying printed web material, comprising:

a chamber, housing a fan disposed within a casing, said casing having a fan inlet in open communication with the interior of said chamber;

duct means for discharging a drying flow of air from said fan to outside said chamber;

means disposed outside said chamber for heating said flow;

means disposed outside said chamber for directing the heated air onto the printed web;

collector means for collecting the solvent mixture resulting from the web-drying operation;

first and second outlet means for allowing outflow of the collected solvent mixture from said collector means, said

first outlet means being connected to the interior of said chamber;

fresh air inlet means also connected to the chamber interior; and,

valve means for independently controlling flow through the first outlet means, the second outlet means and the fresh air inlet means whereby the solvent mixture can be both recirculated and exhausted, without opening the fresh air inlet means.

4,233,902

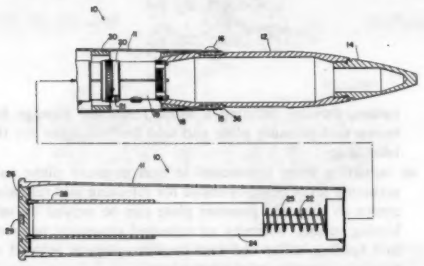
76MM RAMMABLE PRACTICE CARTRIDGE

Frederick Hartley, King George; Keith Slocum, Colonial Beach; John Newquist, and Nicholas Moga, both of Fredericksburg, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1978, Ser. No. 963,605

Int. Cl.³ F42B *5/22, 13/20*

U.S. Cl. 102—41 **7 Claims**



1. An inert dummy cartridge adapted to be repeatedly cycled through automatic gun mounts and capable of simulating the mass, rebound and velocity characteristics of live rounds during ramming comprising:

a cartridge case having a flange on the base thereof;

a projectile body fixed in the open end of said cartridge case and including a dummy fuze, said projectile body and fuze having the same mass and center of gravity as the projectile in a live round;

a shock absorber disposed within said cartridge case and fixed to the base of said projectile body, said shock absorber having a piston projecting rearwardly thereof; and

a mass slidably disposed for axial movement within said cartridge case and fixed to the piston of said shock absorber, said sliding mass being adapted to continue moving forward during the ramming cycle of the gun after the cartridge case flange has engaged the face of the breech block until the momentum of said sliding mass has been dissipated in said shock absorber whereby the mass, velocity and rebound characteristics of a live round are simulated.

4,233,903

SHOTGUN SHELL

Frederick A. Lage, Rte. 2, Gladbrook, Iowa 50635

Filed Jan. 17, 1979, Ser. No. 4,023

Int. Cl.³ F42B *7/00*

U.S. Cl. 102—42 R **9 Claims**

1. A shotgun shell having rearward and forward ends comprising,

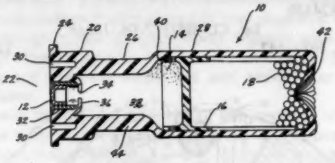
a first cylindrical base portion having an enlarged rim at its rearward end,

a second cylindrical portion extending forwardly from said first cylindrical portion and having an outside diameter less than said first cylindrical portion,

a third cylindrical portion extending forwardly from said second cylindrical portion and having an outside diameter substantially equal to the outside diameter of said first cylindrical portion and having a length substantially greater than the length of said first and second cylindrical portions,

said base portion having a central opening formed in its rearward end for receiving a primer therein,

at least said second cylindrical portion defining a powder chamber which communicates with said central opening,



at least said third cylindrical portion defining a shot compartment,

said powder chamber and said second cylindrical portion defining a wall portion capable of expanding laterally outwardly during the firing of the shotgun shell to reduce the recoil created by said firing.

4,233,904

ASYMMETRICAL SUBWAY VEHICLE

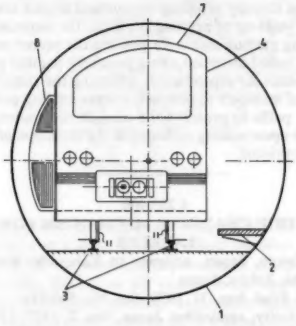
Helmut Bugarcic, Hamburg, Fed. Rep. of Germany, assignor to Waggon Union GmbH, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 951,035

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747286

Int. Cl.³ B61B *13/10;* **B61D** *1/04, 17/00, 19/02*

U.S. Cl. 104—138 R **2 Claims**



1. A subway vehicle, for service in a tunnel having a circular cross-section, comprising, a car body of the vehicle having an asymmetrical cross-section and having a first longitudinal side with a vertical side wall, window and door means on said vertical side wall, said car body having an arcuate roof and an opposite second longitudinal side of an arcuate configuration conforming substantially to the configuration of the tunnel, said car body having an inner shorter vertical wall spaced laterally inwardly from said vertical side wall and defining a passenger space between said vertical side wall and said inner shorter vertical wall, and means defining a utility space between said opposite second longitudinal side and said inner shorter vertical wall for accommodating an air and heating and cable duct.

4,233,905

MAGNETICALLY SUSPENDED VEHICLE

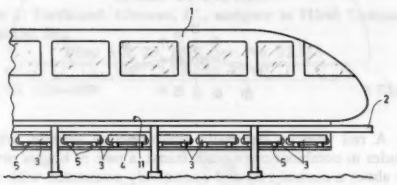
Eveline Gottzein, Oberpframmern; Christian Roche, and Gerhard Bohn, both of Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 815,000

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633647

Int. Cl.[2] B61B *13/08;* B61F *5/00, 5/50*

U.S. Cl. 104—281 3 Claims



1. A magnetic suspension vehicle for use with a rail, comprising a vehicle body, a plurality of suspension magnets, a carrier mounted on the body for carrying said magnets and positioning the magnets beneath the rail, said magnets being longitudinally aligned, a plurality of spring means each individually coupling one of the magnets to said carrier, said vehicle when operating subjecting said magnets to pitch and roll moments, said spring means each having a size and spring constant to impart stabilizing moments to the magnets in the pitch and roll axes which are greater than the pitch and roll moments to which each of said magnets is subjected.

4,233,906

LINEAR INDUCTION MOTOR WITH IMPROVED RAIL ASSEMBLY

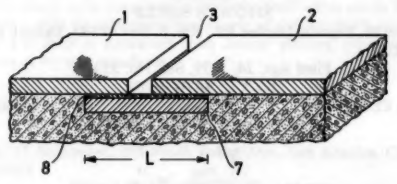
Karl H. Seiler, Breitenau, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 10, 1978, Ser. No. 876,735

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2705954

Int. Cl.[3] E01B *41/02*

U.S. Cl. 104—294 3 Claims



1. In combination with a linear induction motor having a current-induced primary part having a pole length and an electrically conductive reaction rail composed of a multiplicity of successive rail sections, the improvement which comprises an expansion junction between successive rail sections whereby the successive rail sections are one-piece flat elongated plates of constant cross section over their entire lengths and are in inductive energy-transferring relationship with one another but out of direct electrical or mechanical contact and are capable of relative thermal expansion and contraction movement, two main rail sections at each junction have their ends juxtaposed with one another across an air-filled expansion gap and each overlaps in the direction of travel a flat intermediate rail section of the same width and defines a respective induction gap therewith, said induction gap being filled with a solid insulating medium, said intermediate rail section bridging the expansion gap, the length of said rail section corresponding approximately to said pole length.

4,233,907

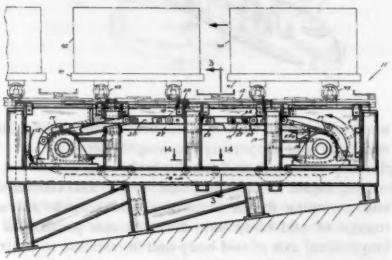
MOLD CONVEYOR DRIVE ASSEMBLY

Joe B. Brown, East Lansing; Louis I. Thompson, and Stephen P. Mishanec, both of Lansing, all of Mich., assignors to Roberts Corporation, Lansing, Mich.

Filed Oct. 25, 1978, Ser. No. 954,463

Int. Cl.[3] B61B *13/12;* B65G *23/16*

U.S. Cl. 104—172 B 6 Claims



1. A mold conveyor drive assembly for driving a mold conveyor chain comprising:

a support frame;

a mold conveyor chain provided on said support frame, said mold conveyor chain defining a plurality of spaced-apart drive dog buttress-receiving openings therein, said mold conveyor chain provided with drive dog buttress-engaging pusher block means at one end of each of said buttress-receiving openings;

a vertically oriented endless cat drive chain mounted on said support frame in spaced-apart aligned register below a rectilinear portion of said mold conveyor chain, said cat drive chain provided with a plurality of spaced-apart drive dog means having mold conveyor chain-engaging buttress portions thereon, said buttress portions adapted to make selective meshing engagement with said buttress-receiving openings so as to exert a central unitary drive force against selected of said pusher block means along the longitudinal axis of said mold conveyor chain;

a plurality of spaced-apart guide wheels provided on said mold conveyor chain intermediate said drive dog buttress-receiving openings;

guide wheel cam rails provided on the support frame along each side of said mold conveyor chain, said cam rails adapted to guidably direct said guide wheels therebetween upon corresponding movement of said mold conveyor chain; and

motor drive means in association with said cat drive chain, said motor drive means adapted to selectively actuate said cat drive chain so as to cause corresponding movement of said mold conveyor chain.

4,233,908

CONSTRUCTION OF REACTOR-DRIVEN ARTICULATED TRAINS WITH ELEVATED TRACKS

Alejandro G. Omar, Avda. del Generalisimo 4, Madrid-16, Spain

Filed Dec. 28, 1978, Ser. No. 973,905

Int. Cl.[3] B61D *17/00*

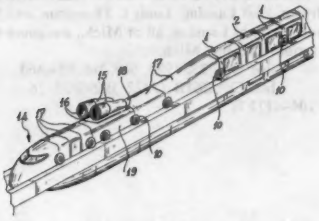
U.S. Cl. 105—3 11 Claims

1. A reactor-driven articulated rail train having a single, tubular, flexible body unit, said body unit comprising:

a plurality of rigid rings, the openings of said rings defining the internal cross-section of said body unit;

elastic joint means comprising a plurality of load-carrying flexible rings having substantially the same opening dimensions as said rigid rings, said body unit being a continuous tubular assembly of said plurality of rigid rings alternating with and joined by said plurality of flexible rings, thereby rendering said tubular unit incrementally flexible;

support means including a plurality of elements adapted to



move along train rails, said elements being spaced along said body unit supporting the weight thereof;

a plurality of seats in said tubular body unit; and

mounting means for attaching said seats to said tubular unit, said mounting means permitting said seats to tilt with respect to said body unit about an axis parallel to the longitudinal axis of said body unit in response to centrifugal force applied to said train.

4,233,909

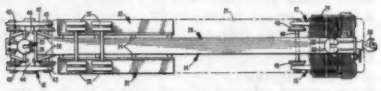
RAILWAY CAR ASSEMBLY COMPOSED OF A SERIES OF ARTICULATELY INTERCONNECTED CARS

Michael B. Adams, Western Springs; John A. Angold, Naperville, both of Ill.; Robert B. Morrison, and Robert E. Zimmerman, both of Topeka, Kans., assignors to Itel Corporation, San Francisco, Calif.

Filed Mar. 28, 1978, Ser. No. 890,984

Int. Cl.[3] B61F *1/00*; B65D *17/10*

U.S. Cl. 105—4 R **26 Claims**



1. A railway car comprising at least two railway car units connected end to end by an articulated connector having mating male and female members, said ends of said car units being mounted on a single truck assembly which spans the space between said ends, each of said car units comprising a center sill which extends substantially the entire length of the car unit, a first of said mating members of said articulated connector fixed to one of said car units and a second of said mating members fixed to a second of said car units, an end sill disposed transversely on each of said car units and extending substantially symmetrically from the center sill, a side bearing support member extending from respective sides of the center sill at points spaced from the said end of each car unit and extending longitudinally between car units, said single truck assembly comprising a pair of side frames holding a pair of axles having wheels mounted thereon, a truck bolster disposed between and extending substantially parallel to said axles for supporting said articulated connector, a side bearing support member on said bolster on opposite sides of the longitudinal axis of the bolster, and one pair of side bearings disposed on each of said bearing support members, each pair of side bearings on the same side of said longitudinal axis of the bolster supporting said pair of side bearing support members of one of said interconnected car units.

4,233,910

RAILWAY CAR HYDRAULICALLY DAMPENED TRACTION RODS

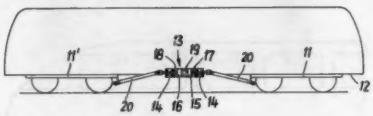
Friedrich Schumacher, Mülheim-Saarn, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Aug. 21, 1978, Ser. No. 935,117

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737834

Int. Cl.[3] B61F *3/08, 5/16, 5/50*

U.S. Cl. 105—182 R **4 Claims**



1. A rail vehicle, especially self-propelled vehicle, which includes in combination: a main frame, a pair of bogies pivotable about a central axis and operatively connected with said main frame and arranged in spaced relationship to each other in the longitudinal direction of said main frame, two hydraulic cylinder-piston systems respectively arranged between and in spaced relationship to said bogies and operatively connected therewith, one of said two cylinder-piston systems being arranged on one side of said frame and the other one of said two cylinder-piston systems being arranged on the other side of said frame, said two cylinder-piston systems being located symmetrically with regard to the longitudinal central axis of said rail vehicle, two pairs of pressure and pull rods respectively interposed between said cylinder-piston systems and each bogie of said pair of bogies, each cylinder-piston system having two separately acting working pistons dividing the pertaining cylinder into two end and one intermediate working chambers, each of the two separately acting working pistons of each cylinder-piston system being respectively pivotally connected to one end of one rod of said pair of pressure and pull rods while the other ends of said pressure and pull rods are respectively pivotally connected to the pertaining bogie of said pair of bogies, and three conduit means for establishing communication between the three respective working chambers of one cylinder-piston system with the corresponding working chambers of the other cylinder-piston system for transmitting pulling and braking forces between bogies and said main frame furnishing an adjustable elasticity during power transmission.

4,233,911

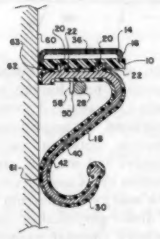
SHOWER SHELF

Grace M. Vignale, Garden Rd., Rte. 5, Box 213-O, Deland, Fla. 32720

Filed Apr. 24, 1979, Ser. No. 32,838

Int. Cl.[3] A47B *41/04*

U.S. Cl. 108—30 **2 Claims**



1. A bracket and shelf assembly mountable on a towel bar that is fixed at a spaced distance from a vertical wall, compris-

ing a plate for supporting articles; a pair of spaced brackets in snap fit engagement with the bottom of said plate; said brackets having upper and lower hook portions; said upper hook portions shaped to fit over said bar, together with

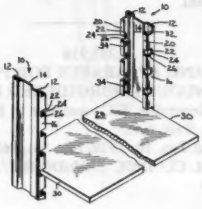
a clip member extending from the underside of the plate, which clip member, in the installed position of the assembly, bears against a side surface of the towel bar which said side surface faces the external surface of the wall to which the towel bar is mounted.

4,233,912

SHELF STANDARD

Irwin J. Ferdinand, Glencoe, Ill., assignor to Hirsh Company, Skokie, Ill.

Filed Apr. 23, 1979, Ser. No. 32,415
Int. Cl.[3] A47B *47/02*
U.S. Cl. 108—109 **1 Claim**



1. A shelf support system comprising two shelf standards, each standard having one backwall and two sidewalls each defining aligned cut-out portions circumscribed by a first edge generally parallel to said backwall and second parallel edges normal to said first edge to define an opening adapted to receive shelving, said backwall having a center section panel which extends forwardly from the backwall a distance greater than the distance from the backwall to said first edge to keep the edge of the shelving being inserted and removed from the shelf support free from contact with said first edge to prevent chafing, shearing or other damage to the shelf when it is being moved relative to the support, each standard also having at least one front section extending from one sidewall generally toward the other sidewall, and generally parallel to the backwall which contains a flange to and in support of shelving when said shelving is fully received by the cut-out portion immediately above said front section, whereby the two shelf standards face each other a distance determined by the length of the shelfs to be supported so that the shelf edges are in firm contact with the center section panels of the standards and so that the shelf is restricted from lateral shifting when fully received by said standards.

4,233,913

SAFE DOOR

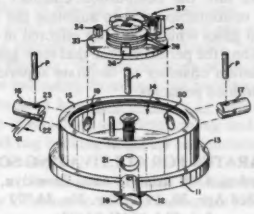
John C. Herrmann, 101 South Fuller Ave., Los Angeles, Calif. 90036

Filed Aug. 23, 1979, Ser. No. 68,948
Int. Cl.[3] E05B *63/00*
U.S. Cl. 109—59 T **8 Claims**

1. A safe door having a circular recess and including, in combination:

(a) a cam plate positioned in said recess with its peripheral outer edge having a given clearance with the inside wall of said recess, said cam plate having a central opening with notches and peripheral cam slots coupled to locking bolts for retracting and extending the bolts from the side of the door upon rotation of the cam plate between first and second positions; and

(b) a cam plate driver supporting combination lock components positioned within said central opening of said cam plate, said driver having driving lugs received in said notches with a clearance greater than said given clearance, whereby any lateral movement of said cam plate as might result from a radially inwardly directed blow on one of said bolts, results in the diametrically opposite



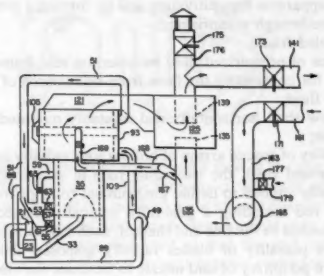
portion of the cam plate engaging the inner wall of said recess before any engagement of the cam plate with said cam plate driver and combination lock components so that the latter components are protected from damage.

4,233,914

PRESSURIZED WASTE WOOD FURNACE SYSTEM

Henry W. Schuette, Tigard, and Charles L. Wellons, West Linn, both of Oreg., assignors to Wellons, Inc., Sherwood, Oreg.

Filed Oct. 2, 1978, Ser. No. 948,091
Int. Cl.[2] F23J *15/00*
U.S. Cl. 110—233 **9 Claims**



1. In a furnace for supplying combustion gases to a dryer for drying articles of commerce wherein such gases leave the dryer as dryer gases,

a fuel cell for burning fuel and having a floor,

air pressure means for introducing ambient air generally tangentially into said cell to cause the combustion gases to whirl around and prolong the period of time the combustion gases stay in the cell to enable superior consumption of the particles of fuel,

said air pressure means creating a sufficient pressure in said cell to create a pressure gradient causing travel of combustion gases from said cell to the dryer,

injection means for injecting fuel to be burned into the floor of said cell against the resistance of the pressure therein,

means for creating an air back pressure zone in said injection means to resist back flow of combustion gases through said injection means,

a combustion chamber above said fuel cell having an inlet for receiving combustion gases from the fuel cell and having an outlet disposed at a level above said inlet,

a blending chamber for receiving combustion gases from said combustion chamber enroute to the dryer,

means for returning a portion of the dryer gases to said blending chamber for intermixing with combustion gases,

and means for returning a portion of the dryer gases to said combustion chamber at a level below the outlet of said combustion chamber and introducing said portion of dryer gases into the combustion chamber in generally tangential relationship so as to augment the whirling action of said gases which has been effected in the fuel cell and to prolong the period of time that such gases remain in the combustion chamber to facilitate superior consumption of entrained particles.

4,233,915

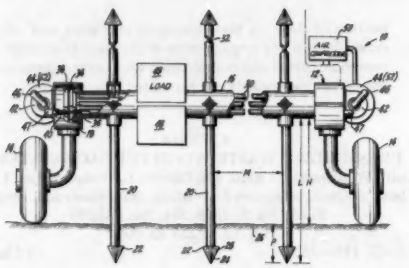
APPARATUS FOR CULTIVATING SOIL

Moonish J. Kordon, 4300 Atlantic Ave., Brooklyn, N.Y. 11224

Filed Apr. 30, 1979, Ser. No. 34,572

Int. Cl.[3] A01C *23/02*

U.S. Cl. 111—6 **5 Claims**



1. An apparatus for cultivating soil by forcing a pressurized fluid therethrough comprising:

a wheeled frame;

a source of pressurized fluid mounted on said frame;

means for controlling the flow from said source of pressurized fluid;

a hollow shaft horizontally and rotatably mounted on said frame;

a plurality of spaced arrays of hollow rods radially extending from said shaft, the individual rods in said arrays being radially aligned to define longitudinal rows of rods, each said rod including a generally conically shaped nozzle connected to the free end thereof, each said nozzle including a plurality of blades radially disposed around the entire periphery of said nozzle to facilitate the embedding of said nozzle in the soil, each said nozzle further including a plurality of outlets disposed along the length of said blades to facilitate the breaking up of the soil, and with the length of each said rod being greater than the distance from said soil to said rotatable shaft; and

conduit means connected to said source of pressurized fluid and said outlets in said nozzles for sequentially channeling said pressurized fluid from said source to said outlets, said conduit means including a plurality of primary pipes disposed inside said hollow rotatable shaft with the number of said primary pipes corresponding to the number of longitudinal rows of said hollow rods and associated therewith, said conduit means further including a plurality of secondary pipes, with each said hollow rod having one secondary pipe disposed therein, said primary pipes being in communication with said pressurized fluid source, and with said secondary pipes being in communication with the associated primary pipe and associated nozzle, said conduit means further including a flange connected to said shaft and rotatable therewith, said rotating flange having a plurality of openings corresponding to the number of primary pipes and in communication therewith, said conduit means further including a stationary flange mounted within said frame and in slidable contact with said rotating flange, said stationary flange having an aperture in communication with said source of pressurized fluid and disposed such that it is sequentially aligned with the opening in said rotating flange which communicates with the primary pipe that is associated with the particular longitudinal row of rods that is then in the vertically downward position, and wherein the movement of said frame causes the sequential embedding of said nozzles of said longitudinal rows of rods in said soil whereby when a longitudinal row of rods is in the vertically downward position, said means for controlling the flow of said source of pressurized fluid releases a short burst of pressurized fluid such that said fluid is channeled through the aligned apertures in said flanges, and through the associated primary pipe to the associated secondary pipes and to said embedded nozzles and is vented through said outlets thereby breaking up the soil.

4,233,916

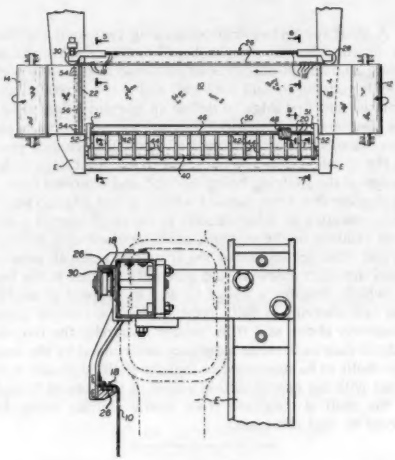
PROCESS AND APPARATUS FOR PRODUCING CONTINUOUS EMBROIDERED FABRICS

David Krieger, Greenville, S.C., assignor to Emb-Tex Corporation, Travelers Rest, S.C.

Filed Jan. 10, 1978, Ser. No. 868,365

Int. Cl.[2] D05C *7/04*; D05B *27/00*

U.S. Cl. 112—90 **7 Claims**



1. An apparatus for making substantially endless lengths of embroidered fabric comprising in combination an embroidery apparatus and a fabric placement and advancement frame for positioning a fabric in an area to be embroidered by said embroidery apparatus and for advancing the embroidered fabric, said embroidery apparatus including means for piercing a fabric to be embroidered with yarns, said fabric and placement frame comprising means for taking the fabric from a supply, means for advancing the fabric across the width of the embroidery apparatus to said area, means for establishing a predetermined tension in the fabric in the area, a plurality of pins extending across the width of the embroidery apparatus near where one edge of the fabric is located, means for pivoting said pins so as to penetrate and engage the edge of the fabric, means for moving said pins after engagement so as to tension and fabric, and means for releasing the fabric after having been embroidered.

4,233,917
NEEDLE STITCHING

Garth A. Carnaby, Papanui, New Zealand, assignor to Wool Research Organization of New Zealand (Inc.), Canterbury, New Zealand

Continuation-in-part of Ser. No. 932,661, Aug. 10, 1978, abandoned. This application Mar. 27, 1979, Ser. No. 24,452
Claims priority, application New Zealand, Aug. 10, 1977, 184895
Int. Cl.³ D05C *15/20*
U.S. Cl. 112—222 **11 Claims**

1. A needle for tufting, sewing, stitching and the like machines, the needle comprising a shaped elongate blade having at one end thereof a shank and at the other end thereof a point adjacent to which is positioned a needle eye, the elongate blade and the point having a shaped path formed therein above the needle eye and on the point, the path being defined by longitudinal recess located in one side of the blade above the eye and a cut-away portion on a side of a region of the point opposite said one side on which the longitudinal recess is located, the path allowing substantially unimpeded movement of yarn through the needle eye when the needle is withdrawn in an upward direction, the path being so shaped and dimensioned as to produce a deflection angle of not more than 13 degrees, said deflection angle being defined as an angle between the axis of a measuring rod having a diameter of exactly 0.3 times the maximum lengthwise extent of the needle eye and the longitudinal axis of the needle.

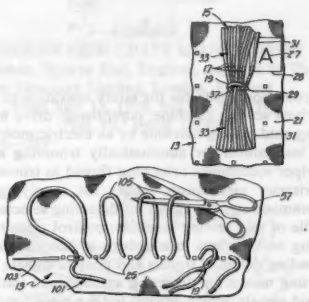
4,233,918
METHOD OF MAKING A RUG

Joseph J. Montell, Laguna Beach, Calif., assignor to Rug Crafters, Santa Ana, Calif.

Continuation-in-part of Ser. No. 810,038, Jun. 27, 1977. This application Oct. 25, 1978, Ser. No. 954,548
Int. Cl.³ D05C *15/00*
U.S. Cl. 112—266.2 **17 Claims**

1. A method of making a rug comprising:
providing a rug backing having a forward face and a back face;
attaching a plurality of elongated flexible tying elements to the rug backing, the end portions of each of said tying elements extending from said rug backing;
providing a plurality of bundles of strands with said bundles being of predetermined lengths;
placing one of said bundles of strands adjacent the forward face of the rug backing and adjacent one of the tying elements;
wrapping said one tying element at least part way around a central region of said one bundle of strands;
tying a knot in said one tying element to attach said one bundle of strands to the forward face of the rug backing whereby said one bundle forms two clumps of pile on the forward face of the rug backing with said clumps being on opposite sides of said tying element and with each of said clumps being about one half of said predetermined length of said one bundle;
leaving the clumps unattached to the rug backing outwardly of said one tying element; and
repeating said steps of wrapping, tying, and leaving to attach a multiplicity of the bundles of strands to the forward face of the rug backing.

16. A method of making a rug comprising:
providing a rug having a forward face and a back face;
attaching a plurality of elongated flexible tying elements to the rug backing, the end portions of each of said tying elements extending from said rug backing;
said rug backing having a plurality of indicia thereon and said step of attaching including sewing said tying elements onto said rug backing adjacent said indicia, respectively;
providing a template;
wrapping a continuous filament around said template a plurality of times to form a multiplicity of loops of said filament;
holding said loops in position on said template by providing a resilient band around said template and said loops;
cutting each of said loops a plurality of times whereby each of said loops forms at least two bundles of strands;
wrapping one of said tying elements a single time around a central region of one of said bundle of strands;
tying a knot in said one tying element to attach said one



bundle of strands to the forward face of the rug backing whereby said one bundle forms two clumps of pile on the forward face of the rug backing with said clumps being on opposite sides of said tying element, said step of tying including forming said knot so that the end portions of said one tying element extend beyond said knot to form additional strands of said one bundle with said additional strands extending for about the same distance from the rug backing as the other strands of said one bundle; and
repeating said steps of wrapping and tying to attach a multiplicity of the bundles of strands to the forward face of the rug backing.

17. A method of making a rug comprising:
providing a rug backing having a forward face and a back face;
attaching a plurality of elongated flexible tying elements to the rug backing, the end portions of each of said tying elements extending from said rug backing;
providing a plurality of bundles of strands;
wrapping one of the tying elements at least part way around a central region of one of the bundles of strands;
tying a knot in said one tying element to attach said one bundle of strands to the forward face of the rug backing whereby said one bundle forms two clumps of pile on the forward face of the rug backing with said clumps being on opposite sides of said tying element;
repeating said steps of wrapping and tying to attach a multi-

plicity of the bundles to the forward face of the rug backing; and

said step of attaching including sewing a tying element strand into said rug backing to form a plurality of loops on the forward face of the rug backing with the tying element strand being attached to the rug backing intermediate each of said loops and cutting said tying element strand at said loops to form a plurality of said tying elements each of which is attached to the rug backing.

4,233,919

SEWING MACHINE PROTECTION APPARATUS

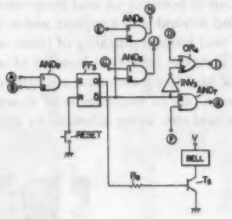
Tadashi Takahashi, and Shigeki Morinaga, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 5, 1978, Ser. No. 921,952

Claims priority, application Japan, Jul. 13, 1977, 52-82874; Sep. 2, 1977, 52-104887

Int. Cl.³ D05B *69/22, 69/36, 19/00*

U.S. Cl. 112—277 **7 Claims**



1. A protection apparatus for safety operation of an electric motor-driven sewing machine, comprising: drive mechanisms for driving said sewing machine by an electric motor; a thread trimmer mechanism for automatically trimming a thread; a thread wiper mechanism removing thread as trimmed by said thread trimmer mechanism, means for supplying predetermined command signals; means for detecting selected positions of a needle of said sewing machine; control circuit means for controlling said various mechanisms in accordance with the corresponding detected signals and control signals; abnormality detecting means for detecting an abnormal state in which two of said signals, which are not to take place simultaneously during normal operation, occur simultaneously and for generating an output abnormality signal in response thereto; and means for responding to the output abnormality signal from abnormality detecting means thereby to invalidate operations of at least said drive mechanism, said automatic thread trimmer mechanism and said thread wiper mechanism and to actuate a stoping mechanism to stop the operation of said sewing machine.

4,233,920

VEE HULL CONSTRUCTION

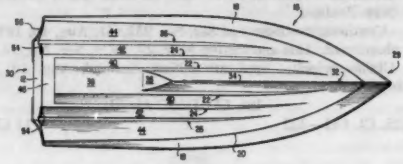
Forrest L. Wood, Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Flippin, Ark.

Filed May 24, 1979, Ser. No. 42,200

Int. Cl.³ B63B *1/00*

U.S. Cl. 114—56 **4 Claims**

1. In a power boat hull having a plurality of chine pairs extending fore and aft intermediate the bow and transom thereof; the central one of said chine pairs straddling a centerline keel portion exhibiting a forward vee section and an aft concave section comprising a concave planing pad; said forward vee section merging with said planing pad via an upwardly and rearwardly directed transition area for introducing air to said concave planing pad as the hull approaches full plane and directing air and water thereto during full plane; said concave planing pad terminating at the after end thereof in a transverse step immediately adjacent and forward of said transom whereby water flowing thereacross includes an upward



component at the plane of the transom; and the plane of said transom extending, from above the water line, downwardly and forwardly to said transverse step.

4,233,921

TRANSPORT VESSELS HAVING LIQUID GAS STORAGE TANKS

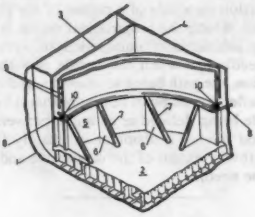
Jaime M. Torroja, Madrid; Jose U. Rivacoba, Bilbao, and Ricardo M. Herrero, Madrid, all of Spain, assignors to Sener Ingenieria y Sistemas, S.A., Madrid, Spain

Filed Jan. 26, 1979, Ser. No. 6,859

Claims priority, application Spain, Jan. 31, 1978, 466.499

Int. Cl.³ B63B *25/14*

U.S. Cl. 114—74 R **12 Claims**



1. In a vessel equipped with at least one pressurized independent tank wherein there is at least one support covering placed above a substantially horizontally oriented platform, the improvement comprising:

means for reducing the tensions induced in the tank and its support covering due to vertical deformations of the hull of the vessel, said means including

a continuous sheet located above said platform and being positioned substantially parallel to said platform,

a deformable element capable of regaining its form and being placed between said continuous sheet and said platform;

said continuous sheet being connected to the platform by means of at least one intermediate element and being equipped with a central opening through which said tank can pass,

said deformable element being capable of transmitting, between said continuous sheet and said platform, perpendicular forces of the hull of the vessel,

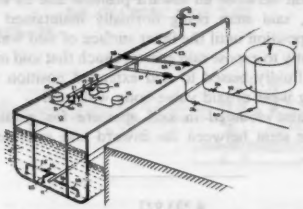
said continuous sheet being constructed to transmit parallel forces of the hull of the vessel in the form of sharp pressures, while at the same time allowing vertical deformation of the deformable element.

4,233,922

FLUID TRANSFER SYSTEM FOR TANKER VESSELS

Charles S. Conway, Featherbed La., New Vernon, N.J. 07976

Filed Feb. 9, 1979, Ser. No. 10,909
Int. Cl.[3] B63B 25/12
U.S. Cl. 114—74 R 10 Claims



1. In a tanker vessel for the transportation of fluid chemical and petroleum products in water, said vessel including a hull comprising a bottom and sides, a top deck, a plurality of watertight and substantially air-tight cargo compartments disposed within said hull between said top deck and said hull bottom for receiving said products, cargo expansion trunk means coupled to and opening downwardly into each of said cargo compartments, branch vent line means coupled to the cargo expansion trunk means and including pressure/vacuum relief valve means, and longitudinally disposed trunk vent line means including pressure/vacuum relief valve means, said trunk vent line means being coupled to said branch vent line means and being communicative with the atmosphere for venting contaminated gases formed by said fluid products and contained within said cargo compartments from said cargo compartments through said cargo expansion trunk means and said branch vent line means to the atmosphere, the improvement comprising bypass vent line means including vent closure valve means coupled to at least one of said cargo compartments, said bypass vent line means being coupled at one end to said trunk vent line means and at the other end to said cargo expansion trunk means of said one of said cargo compartments, said vent closure valve means being adapted to be opened and couple said trunk vent line means to said cargo expansion trunk means of said one of said cargo compartments through said bypass vent line means thereby bypassing said pressure/-vacuum relief valve means of said branch vent line means and venting contaminated gases to or from said one of said cargo compartments through said cargo expansion trunk means of said one of said cargo compartments, and bypass vent line means and said trunk vent line means.

4,233,923

SAFETY RELEASE FOR WATER SKIING TOW LINE

Edward F. Casad, St. Marys, and Thomas R. Casad, Celina, both of Ohio, assignors to Ajax Machine & Welding Co., St. Marys, Ohio

Filed Oct. 5, 1978, Ser. No. 948,958
Int. Cl.[2] B63B 21/56
U.S. Cl. 114—253 10 Claims

1. A safety release for water skiing tow ropes actuable by a tow boat occupant comprising:

a body having front and rear portions;

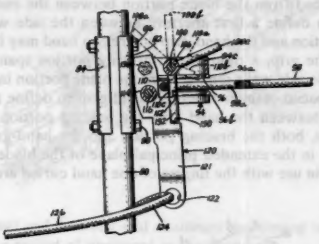
first means for removably attaching said body to a towing boat;

a horizontally disposed slot formed in and opening through the front portion of said body and adapted to slidably receive a loop of rope therein, the loop being slidable in said slot between a rearward slot position to a forward loop-attaching position;

second means for engaging and positioning the loop in the slot;

said second means being freely movable in a rearward direction out of said slot under a pulling force of said rope;

third means pivotably movable into engagement with said second means for holding said second means in said loop-attaching position and for manually releasing said engagement to permit said second means to move rearwardly,



said engagement being substantially in a horizontal plane including the pivot axis of the third means, locating means including said slot for positioning said loop of rope in or above the plane of said engagement; and

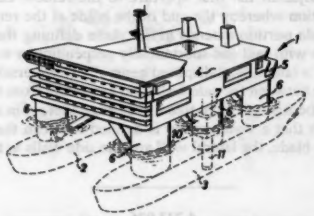
fourth means for yieldably retaining said third means in engagement with said second means.

4,233,924

UNDERWATER CRAFT LAUNCH TUBE

John S. Clinton, Bourne End, England, assignor to The British Petroleum Company Limited, London, England

Filed Apr. 13, 1978, Ser. No. 895,996
Int. Cl.[3] B63B 35/40
U.S. Cl. 114—259 14 Claims



1. A launch tube for passing an underwater craft through an air/liquid interface comprising a substantially vertical passageway having a surrounding surge chamber adjacent to the air/liquid interface, the surge chamber communicating with the passageway through a perforated section of the passageway, the chamber and perforations being of a size and distribution in relation to the passageway such that there is damping of liquid oscillation in the tube.

4,233,925

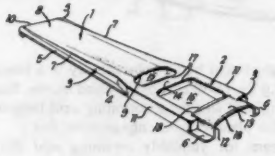
PADDLES FOR BOATS

Douglas B. I. Proctor, "Fenmead", Brook Ave., Warsash, Hampshire, England

Filed Feb. 21, 1979, Ser. No. 13,561
Claims priority, application United Kingdom, Feb. 23, 1978, 7259/78
Int. Cl.[3] B63H 16/04
U.S. Cl. 440—101 7 Claims

1. A paddle of rigid unitary construction formed in plastics material, for use with boats, and consisting of a hand-receiving portion forming one end-part of the paddle, a longitudinally extending generally planar blade portion of substantially

greater length than width forming the other end-part and laterally spaced walls extending longitudinally in both the blade portion and the hand-receiving portion, the side walls having lower edges which lie in a plane defining the base of the paddle and being disposed generally transversely to said plane; a rigid lateral hand-grip that is relatively narrow in the longitudinal direction spanning the side walls at a position longitudinally spaced from the blade portion between the ends of the paddle to define a first aperture between the side walls, the blade portion and the hand-grip whereby a hand may be curled around the grip; a rigid lateral bracing portion spanning the ends of the side walls remote from the blade portion in longitudinally spaced manner from the hand-grip to define a second aperture between the hand-grip, the bracing portion and the side walls, both the bracing portion and the hand-grip lying generally in the extended principal plane of the blade portion whereby in use with the fingers of one hand curled around the



hand-grip, the hand extends through the second aperture with the lower arm bearing against the bracing portion to restrain the paddle against pivotal movement with the grip while the blade portion is subjected to pressure during propulsion, and wherein in the blade portion extends across the side walls from upper portions thereof and longitudinally from a position adjacent the first aperture to the remote end of the blade portion, the side walls in the blade portion tapering in height from said position adjacent the first aperture to the remote end of the blade portion whereby the end of the blade at the remote end of the blade portion extends in the plane defining the base of the paddle with said end substantially perpendicular to the side walls, and a lateral wall disposed generally transversely to said base plane between the side walls and extending from the blade adjacent the first aperture to a lower edge thereof in said base plane such that a water scoop is defined between the remote end of the blade, the lateral wall and the side walls in the blade portion.

4,233,926

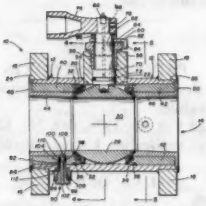
FLANGE VALVE HAVING IMPROVED SEALING CHARACTERISTICS AND WEAR INDICATOR

Philip W. Rogers, and Claude E. Parkin, both of Mexico City, Mexico, assignors to A. Dean Mammel, Dallas, Tex.

Division of Ser. No. 695,973, Jun. 14, 1976, Pat. No. 4,137,709. This application Jul. 31, 1978, Ser. No. 929,453

Int. Cl.[3] G01D *21/00;* **G01L** *19/12;* **F16C** *15/04*

U.S. Cl. 116—208 **8 Claims**



1. A wear detector for a valve including a valve body with a wall defining a fluid flow path through the valve, comprising:

said wall having inner and outer surfaces and being of predetermined thickness,

said wall including an aperture formed in the outer surface of said wall to a depth less than said predetermined thickness corresponding to the amount of wear of the inner wall surface desired to be detected,

an indicator stem slidably mounted within said aperture for movement between an inward position and an extended position, said stem being normally maintained in said inward position until the inner surface of said wall wears sufficiently to expose said aperture such that said indicator stem is fluidly biased to said extended position thereby signaling wear of said valve body wall, and

sleeve means mounted in said aperture for guiding said indicator stem between the inward and extended positions.

4,233,927

INSTRUMENT ASSEMBLY WITH ILLUMINATED METER MOUNTING PANEL

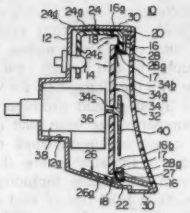
Akio Oikawa, Yokosuka, and Koji Sasai, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 18, 1979, Ser. No. 49,450

Claims priority, application Japan, Jun. 21, 1978, 53-74137

Int. Cl.[3] G01D *11/28;* **G05D** *25/02*

U.S. Cl. 116—287 **10 Claims**



1. An instrument assembly, comprising:

a casing having a generally open front side;

at least one meter movement disposed in said casing;

a spindle extending from said movement toward the front side of said casing and being rotatable about the axis thereof;

a dial board disposed in said casing in front of said meter movement and having a front face facing the front side of said casing, said front face having indicia thereon and an opening therein through which said spindle passes;

a pointer having a hub portion fixed to said spindle so as to move over the front face of said dial board in response to rotation of said spindle;

a meter mounting panel having a rear edge and a front portion, said front portion positioned in said casing in front of said dial board and having an opening through which the front face of said dial board is exposed, said panel being constructed of a transparent material;

an opaque layer covering at least a portion of the face of said panel which faces away from the front side of said casing;

at least one light source located in said casing at a position to the rear of said dial board for producing light;

a light guiding member which is constructed of a transparent material and is located with respect to said light source and said rear edge of said panel so as to transmit the light from said light source to the edge of said panel; and

means formed on said panel for reflecting the light which has entered the edge of said panel in a direction parallel to the front face of said panel, whereby the reflected light travels in said panel to illuminate the entire of said panel from within.

4,233,928

INNER BURR CUTTING, INNER FACE CLEANING AND INNER FACE PAINTING APPARATUS FOR LONG PIPES OF SMALL AND MEDIUM DIAMETERS

Keiichi Hara, and Tomoji Fujisawa, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1979, Ser. No. 68,512
Claims priority, application Japan, Aug. 29, 1978, 53-105230
Int. Cl.[3] B05C 5/00, 7/02
U.S. Cl. 118—35 7 Claims

1. An inner burr and inner surface cleaning apparatus for pipes of medium and small diameters comprising:

a base;

a carriage mounted on the base and reciprocable along a long pressure-welded pipe of medium and small diameters having an inner burr produced on an inner face thereof;

a supporting tube inserted into the pressure-welded pipe and having two ends, one end being supported by the carriage;

first drive means mounted on the carriage;

a hollow cylindrical rotary shaft having two ends and passing through the supporting tube with one end protruding from said other end of the supporting tube and rotated at the other end thereof by the first drive means;

inner burr cutting means fixedly mounted on the rotary shaft for cutting off the inner burr;

sets of guide rollers, each of said sets being arranged circumferentially on an outer periphery of the supporting tube for contacting the inner face of the pressure-welded pipe;

centering means disposed at the other end of the supporting tube for centering the inner burr cutting means in the pressure-welded pipe;

second drive means mounted on the centering means;

spatter crushing means disposed adjacent to the second drive means and rotated thereby for crushing spatters produced in the pressure-welded pipe, said spatter crushing means having two ends, one end being nearer to the carriage and the other end being more remote therefrom;

electromagnetic means disposed at one of said two ends of the crushing means for attracting chips and spatters in the pressure-welded pipe;

spattering prevention means disposed between the inner burr cutting means and said one end of the supporting tube;

a paint spraying device disposed at an end of the apparatus which is remote from the carriage for spraying paint on the inner face of the pressure-welded pipe; and

a cooling device surrounding pressure-welded portions of the pressure-welded pipe for cooling said pressure-welded portions.

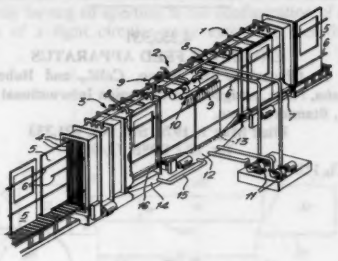
4,233,929

APPARATUS FOR THE TREATMENT OF TIMBER

Robert G. Hurst, High Wycombe, and Alan L. Pinner, Beaconfield, both of England, assignors to Protim International Limited, Marlow, England

Filed Jan. 8, 1979, Ser. No. 1,803
Int. Cl.[3] C23C 13/08, 11/00; B05D 3/00
U.S. Cl. 118—50 7 Claims

1. An apparatus for the continuous treatment of a sucession of individual generally elongate items of timber, comprising a vessel having at least three chambers arranged in series for passage of the timber therethrough, means for drawing a vacuum in each of the end chambers and means for spraying the timber with preservative liquid in an intermediate chamber, guide means for holding the timbers upright, conveying means for transporting the upright timber sequentially through said chambers, sealing means adapted to maintain the vacuums in the end chambers, said sealing means being located at the ends



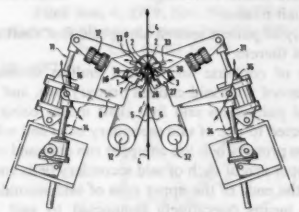
of the vessel and between said chambers and timing means to control the period of treatment in the chambers.

4,233,930

APPARATUS FOR THE CONTINUOUS AND SIMULTANEOUS APPLICATION OF COATINGS OF CONSTANT THICKNESS TO BOTH SIDES OF A WEB

Gerhard Wohlfeil, Monheim, Fed. Rep. of Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 9, 1979, Ser. No. 2,771
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2845036
Int. Cl.[3] B05C 11/04
U.S. Cl. 118—122 11 Claims



1. In an apparatus for the continuous simultaneous application of coatings of constant thickness to two sides of a material web, having two adjustable two-edged spreader blades confronting one another at an angle, between which the material web passes for the proportioning of the coatings, a chuck for each blade, and means clamping each spreader blade at a clamping line along one edge in the chuck, the other edge of each blade parallel to the clamping line being free and engaging under bias and a corresponding biasing force the material web carried over the free edge of the other spreader blade along an engagement line at an acute attitude angle with respect to the direction of movement of the material web, and means applying said biasing force to each blade along a fulcrum line, the improvement wherein one spreader blade is rigid and the other spreader blade is resilient, means mounting the chuck of the resilient spreader blade for pivoting movement of the resilient spreader blade about the engagement line between the resilient spreader blade and the rigid spreader blade and about a line outside of the clamping line for movement of said resilient blade away from said rigid blade, and means mounting the clamping means of said resilient blade to effect displacement of the clamping line of the resilient spreader blade relative to its fulcrum line and relative to the rigid spreader blade to adjust the biasing force without changing the attitude angle between the fulcrum line and the engage-

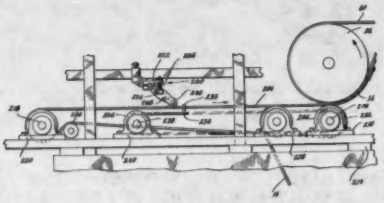
ment line of said resilient blade, while the engagement line and fulcrum line of the resilient spreader blade are fixed relative to the rigid spreader blade during a continuous coating operation.

4,233,931

ENVELOPE FEED APPARATUS

David L. Gingerich, San Bruno, Calif., and Robert Cohn, Omaha, Nebr., assignors to Champion International Corporation, Stamford, Conn.

Filed May 1, 1978, Ser. No. 901,333
Int. Cl.³ B05B *13/00*
U.S. Cl. 118—239 **3 Claims**



1. In an apparatus for applying a sealant material to the flap closure and adjacent body portion of an envelope, said apparatus including at least one endless primary belt for supporting and conveying said envelopes between it and an overlapping belt through said apparatus and means for applying sealant material to the flap closure and an adjacent body portion of said envelope, the improvement comprising:

means for feeding said envelopes onto said endless primary belt, said means including:

a first shaft means;

a plurality of pulleys spaced along said first shaft means and affixed thereto;

a group of coplanar and spaced endless secondary belts interleaved with said endless primary belt, and with each of said pulleys on said first shaft means being drivingly connected to one of said secondary belts and wherein said endless primary belt has an upper run disposed coplanar to the upper run of each of said secondary belts and intermediate the ends of the upper runs of said secondary belts;

a drive means operatively connected to said first shaft means;

means for holding said envelopes on said group of secondary belts, said means including a vertically adjustable roller in contact with the upper run of each said secondary belts;

first sprocket means fixed to each of said pulleys of said first shaft means, said first sprocket means having a diameter less than the diameter of said pulleys, such that the peripheral surface speed of said sprocket means is less than the peripheral surface speed of said pulleys;

a second shaft means;

second sprocket means fixedly connected to said second shaft means;

an endless chain, said chain being drivingly connected to said first and second sprocket means, said endless chain moving at a speed equal to the speed of said primary belt and slower than the speed of said secondary belts; and

a plurality of spaced upright dogs connected to said endless chain, whereby the envelopes being conveyed on said secondary belts move at a speed faster than said dogs on said endless chain, such that each envelope catches up with and is restrained by an individual dog thereby spacing each envelope a predetermined distance from the succeeding envelope and conveying said envelopes at a speed equal to said primary belt thereby assuring that the envelopes are securely fed in spaced relation onto said endless primary belt.

4,233,932

CONTROLLED DISPERSIONS OF COATINGS

Harry N. Blakeslee, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 17, 1978, Ser. No. 961,513
Int. Cl.² B05B *13/06*
U.S. Cl. 118—306 **10 Claims**

1. An apparatus for distributing coating material in a predetermined manner comprising:

(a) a first means mounted for rotation about an axis at relatively high angular velocity for disbursing coating material from said first means,

(b) a coating delivery means having a pressurized coating material supply and a transportation system connected and arranged to deposit a quantity of coating material upon said first means,

(c) a shaped passage ending in a generally non-circular orifice nozzle means at the distal portion of said transportation system and generally in alignment with said axis for defining the form of said deposit for its distribution by said first means, and

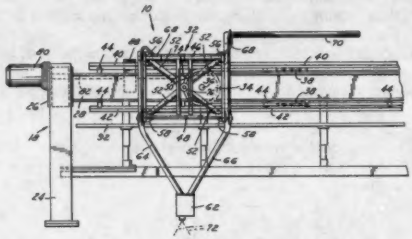
said nozzle means having a configuration bearing a relationship to the distribution pattern desired for disbursing coating material in a predetermined manner.

4,233,933

SPRAY COATING MACHINE

Dorian R. Gray, Nashville, Tenn.; Richard N. Bishop, Plymouth, and William K. Timmons, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 21, 1979, Ser. No. 41,206
Int. Cl.³ B05C *5/00*
U.S. Cl. 118—314 **1 Claim**



1. A machine for applying a spray coating across the width of a glass ribbon being carried on a conveyor moving past the machine, the machine comprising:

first support structure including right side support structure located on the right side of the conveyor and left side support structure located on the left side of the conveyor;

second support structure including upstream support structure and downstream support structure, said upstream and downstream support structures having their opposite ends secured to said right side support structure and said left side support structure in a manner that said upstream and said downstream support structures extend across the conveyor in a position spaced above the same;

said upstream support structure and said downstream sup-

port structure each having the following structure mounted thereon;

a pair of pulleys, one mounted near each of the ends of said structure,

an endless drive chain extending over said pair of pulleys,

guide means for forming a guide track, said guide means extending along the length of said structure generally from one end to the other end thereof,

spray gun carrying means for supporting a spray gun and associated equipment, said spray gun carrying means being mounted on said guide means for movement back and forth along said structure above the glass ribbon on the conveyor,

spray gun and associated equipment means for applying a spray of material to the glass ribbon on the conveyor, said spray gun and its associated equipment means mounted on said spray gun carrying means for movement along said structure,

pin and slot lost motion connection means for interconnecting said spray gun carrying means and an interconnecting portion of said endless drive chain in a manner that said endless drive chain moves said spray gun carrying means from one side to the other while said interconnecting portion of said endless drive chain is moving from one of said pulleys to the other and that the direction of movement of said spray gun carrying means is reversed when said interconnecting portion of said endless drive chain moves around a pulley,

said spray gun carrying means being so mounted on their associated guide means and interconnected with their associated endless drive chain that said spray gun carrying means on said upstream support structure and said spray gun carrying means on said downstream support structure move in opposite directions past one another at the center of the upstream and downstream support structures and are reversed in direction at the same time;

motor means for supplying a rotational input;

a gear reduction drive;

an input shaft interconnecting said motor means and said gear reduction device;

output shafts interconnecting said gear reduction device and pulleys located at the same end of said upstream and said downstream support structures; and

a flywheel connected to said input shaft for storing energy while said endless drive chains are moving their associated spray gun carrying means between pulleys and for supplying additional input to said gear reduction device and output shafts associated therewith to accelerate said spray gun carrying means to an operating speed after reversal of direction of movement thereof.

4,233,934

GUARD RING FOR TGZM PROCESSING

Thomas R. Anthony, Schenectady, N.Y.; Harvey E. Cline, Stanford, Calif.; David K. Hartman, Manlius, and Mike F. Chang, Liverpool, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

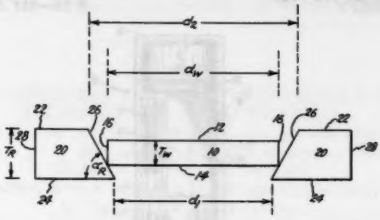
Filed Dec. 7, 1978, Ser. No. 967,285
Int. Cl.³ C23C *11/00*
U.S. Cl. 118—500 **6 Claims**

1. In an apparatus for processing a wafer of semiconductor material having two major opposed surfaces substantially parallel to each other and an outer peripheral edge area interconnecting said surfaces by thermal gradient zone melting, said apparatus including a heat source adjacent to one major surface of said wafer, a heat sink adjacent to the opposed major surface of the said wafer and means for removably supporting said wafer between said heat source and said heat sink; the improvement wherein the means for supporting said wafer comprises:

a body of semiconductor material having two major opposed surfaces substantially parallel to each other and an outer peripheral edge surface interconnecting said major surfaces;

the semiconductor material of said body having substantially the same thermal conductivity as that of said wafer;

said body having an aperture in the configuration of a frustrum of a right circular cone extending therethrough



forming thereby an inner peripheral surface in said body whereby said wafer can be disposed within said aperture with said major surfaces of said wafer and said body substantially parallel to each other, said wafer being supported under its own weight within said aperture; and

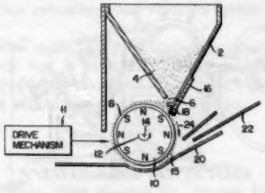
the thickness of said body being greater than the thickness of said wafer.

4,233,935

MAGNETIC BRUSH APPARATUS FOR ELECTROSTATIC PRINTING SYSTEM

Tsutomu Uehara, Yokosuka; Toshihiko Oguchi, Kawasaki; Tsutomu Kubo, Yokohama, and Yukio Suzuki, Ayase, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 4, 1979, Ser. No. 1,003
Claims priority, application Japan, Jan. 14, 1980, 53-3052
Int. Cl.³ G03G *15/09*
U.S. Cl. 118—657 **7 Claims**



1. A magnetic brush apparatus comprising:

means for supplying a powdered one-component developer composed of particles each including a magnetic material;

a tubular sleeve made of non-magnetic material the surface of which is supplied with powered developer from said supplying means;

a rotatable magnet roller with a number of magnet poles which is disposed within said tubular sleeve;

drive means for rotating said magnet roller in one direction, said rotating magnet roller forming an alternating magnetic field on the surface of said tubular sleeve thereby carrying said powered one-component developer around the surface of said tubular sleeve; and

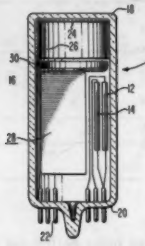
means for restricting the height of said powdered developer to a predetermined level, including a magnetic member one end of which is disposed outside said sleeve surface a predetermined distance such that said developer passes between said one end of the magnetic member and said sleeve surface, said magnetic member disturbing the alternating field on the sleeve surface, thereby restricting the height of said powdered developer moving past said one end of the magnetic member to said predetermined level.

4,233,936

ALKALI METAL DISPENSER

Richard W. Longsderff, and Dale V. Henry, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 8, 1979, Ser. No. 37,117
Int. Cl.[3] B44D *1/02*; C23D *1/02*
U.S. Cl. 118—726 **5 Claims**



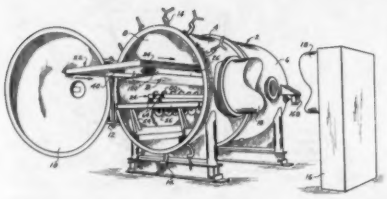
1. An alkali dispenser for vapor depositing an alkali material in the production of a photocathode, said dispenser comprising a non-welded tubular housing of a sheet of thin deformable metal selected from group consisting of tantalum and chromium-nickel-steel spirally rolled upon itself to provide a double walled structure for a substantial portion of the cylindrical circumference thereof, having at a minimum one and one half overlaps, said tubular housing being closed at its two ends.

4,233,937

VAPOR DEPOSITION COATING MACHINE

Kenneth E. Steube, St. Charles, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jul. 20, 1978, Ser. No. 926,561
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—727 **17 Claims**



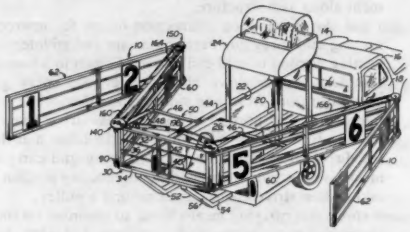
1. A vapor disposition coating machine for applying a coating metal to a workpiece, said machine comprising: an air-tight vessel having walls which enclose a vacuum chamber and define a door opening, the vessel also having a door which when closed seals the door opening and when opened provides access to the vacuum chamber; a rack supported on the vessel within the vacuum chamber for holding a workpiece in a fixed position within the vacuum chamber; a carriage located within the vacuum chamber below the rack, the carriage being substantially narrower than the rack, but about the same length as the rack; means for moving the carriage in translation beneath the rack generally from one side of the vessel to the other; a plurality of evaporator units mounted on the carriage generally along the entire length thereof, each evaporator unit including a boat in the shape of an upwardly opening trough, the boat being formed from a substance that is capable of conducting an electrical current and serving as a resistance type heating element, each evaporator unit also including means for feeding the coating metal in wire form into the trough of the boat for that unit; first and second current conducting means extended between the boats and fixed locations on a wall of the vessel for delivering electrical energy to the boats, the first conducting means being connected to one end of each boat and the second conducting means being connected to the opposite end of each boat, both the first and second conducting means being flexible, at least in part, to accommodate movement of the carriage in the chamber; and means for circulating a fluid coolant along the first and second conducting means to dissipate heat therefrom, the means for circulating the fluid coolant also being flexible so as to flex with first and second conducting means.

4,233,938

FOLDING WING ASSEMBLY

Roger R. Ruetenik, West Lake Rd., Vermillion, Ohio 44089

Filed Oct. 24, 1978, Ser. No. 954,288
Int. Cl.[3] A63K *3/02*; A01K *29/00*
U.S. Cl. 119—15.5 A **15 Claims**



1. A foldable wing assembly, comprising:

a. a mount for rotatably supporting a plurality of wing-forming members;

b. a plurality of wing-forming members including:

i. at least one interior wing-forming member, and,

ii. a terminal wing-forming member;

c. rotatable juncture means at the proximal end of each of said wing-forming members joining said members in pivotal serial relationship;

d. primary, fixed pivot means disposed at each of said juncture means for each of said interior wing-forming members;

e. secondary pivot means journalled at the distal end of each of said interior wing-forming members;

f. coupling means, at the distal end of each of said interior wing-forming members and traversing the respective rotatable junctures, for securing said secondary pivot means on one wing-forming member to the proximal end of a next successive wing-forming member, whereby said secondary pivot means are fixed in rotational communication with said proximal ends; and,

g. linkage means providing operative engagement between adjacent primary and secondary pivot means.

4,233,939

POULTRY CAGE FEEDING SYSTEM

Walter Sauer, Aschaffenburg, and Berthold Gerhart, Mömbris, both of Fed. Rep. of Germany, assignors to Hans Giesbert Kommanditgesellschaft, Mombris, Fed. Rep. of Germany

Filed Mar. 22, 1979, Ser. No. 23,054
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1979, 2739747
Int. Cl.[3] A01K *39/00, 39/014*
U.S. Cl. 119—18 **4 Claims**

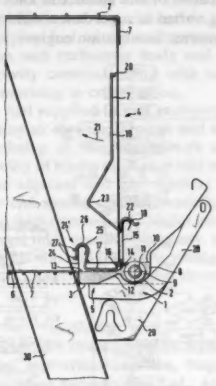
1. A feeding cage battery having at least one cage for small animals, particularly poultry, and a trough stationary relative to the cage, the trough comprising:

a conveyor trough section removed from the cage and extending along a lower edge of the cage;

a feed trough section located in a recess formed in the bottom of the cage;

inclined barrier means extending between respective bottom

portions of the conveyor and feed trough sections, for the length thereof, for permitting only unidirectional flow of feed from the conveyor trough section to the feed trough section; and



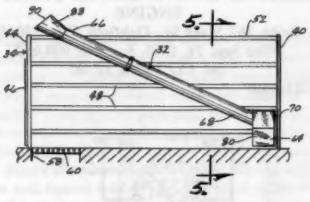
partition means mounted between the relative top portions of the conveyor and feed trough sections for completing, with the barrier means to provide a small gap between the trough sections and said partition means sufficient for feed flow therebetween but insufficient for allowing access to the conveyor trough section by an animal.

4,233,940

LIVESTOCK FARROWING APPARATUS

Rex E. Hennenfent, 1270 Arrowhead Dr., Dubuque, Iowa 52001

Filed Jan. 2, 1979, Ser. No. 126
Int. Cl.³ A01K *1/02*
U.S. Cl. 119—20 **12 Claims**



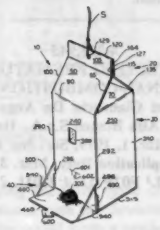
1. A hog farrowing apparatus, comprising,
an elongated rectangular crate having forward and rearward ends and elongated opposite sides,
means for opening and closing said rearward end to provide for the entrance of a sow therein with its head positioned toward said forward end,
said opposite sides being sufficiently closely spaced to prevent turning movement of a sow therein to a position with its head disposed toward said rearward end,
an elongated hollow feed tube outside of said crate and on one side of said crate and extending from an upper end adjacent said rearward end of said crate to a lower end adjacent said forward end of said crate, and
a feed trough adjacent said forward end of said crate and in communication with the lower end of said feed tube whereby feed deposited in the upper end of said feed tube outside of said create and will move by gravity to said feed trough.

4,233,941

DISPOSABLE WILD BIRD FEEDER

Ralph K. Webster, Andover, Mass., assignor to H. K. Webster Company, Inc., Lawrence, Mass.

Filed Feb. 26, 1979, Ser. No. 15,046
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—52 R **6 Claims**



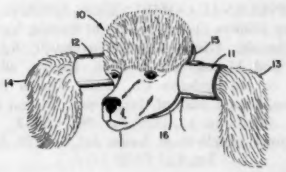
1. An expendable bird feeder comprising:
a cartonized container having a generally rectangular tubular configuration with front, rear and side walls and adapted to enclose a plastic bag of bird seed,
and a bottom closure for said container including a movable perch flap extendable to form a vertical closure wall adjacent said front wall having locking tabs at the sides thereof receivable in corresponding detent openings at the sides of said front wall,
said perch flap having a locking tab at its free edge engageable with a detent opening formed in said front wall to lock said perch flap in a closed vertical position,
a punch-out opening at the bottom of said front wall behind said perch flap and through which bird seed may be metered gravitationally onto the perch surface when said perch flap is moved to said second position,
whereby said panel flap may be locked in a first storage position adjacent said front wall and may be selectively unlatched and pulled down to a second active position forming a horizontal perch surface extending away from the bottom of the enclosure,
said container made of wax coated paper stock,
and a plastic bag of bird seed in said container having a bottom portion opening out of said punch-out opening for selective perforation when ready for use.

4,233,942

ANIMAL EAR PROTECTORS

James D. Williams, 3700 Westfall Dr., Encino, Calif. 91436

Filed Feb. 6, 1979, Ser. No. 9,776
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—96 **1 Claim**



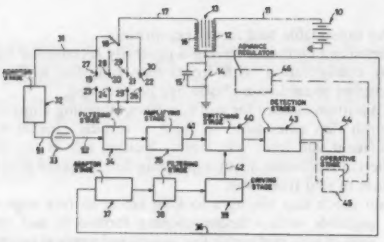
1. A device for protecting animal ears comprising:
a pair of generally tubular protectors each of which is formed of a sheet of self-biasing material which in their free state tend to form themselves into said generally tubular protectors;
each of said protectors being longitudinally openable to allow easy insertion of one of said animal ears; and
positioning means for flexibly joining one end of one protec-

tor in spaced apart relationship with one end of the other protector and for securing said device to the head of said animal such that the longitudinal axis of each protector and a portion of each ear of said animal, are held generally horizontally and approximately perpendicularly to the head of said animal whereby the ends of said animal ears are separated by a distance greater than the width of the head of said animal.

4,233,943
DEVICE FOR DETECTING PREMATURE IGNITION IN AN INTERNAL-COMBUSTION ENGINE

Edoardo Rogora, and Giancarlo De Angelis, both of Milan, Italy, assignors to Alfa Romeo S.p.A., Italy

Filed Mar. 1, 1979, Ser. No. 16,620
Claims priority, application Italy, Mar. 3, 1978, 20888 A/78
Int. Cl.[3] F02P *5/14*; G01L *23/22*
U.S. Cl. 123—425 **4 Claims**



1. A device for detecting the pre-ignition in an internal-combustion engine having a controlled ignition, which is connected to the ignition system of the same engine, said ignition system comprising circuit means for controlling cyclically the sparking at each plug of the engine with an ignition advance variable as a function of the working condition of the same engine, said device comprising first means operatively connected to at least one of the spark plugs of the engine adapted to generate signals indicative of the state of conduction of the same plug, that is of the ionization between its electrodes, the device being characterized in that it comprises second means operatively connected to said circuit means, adapted to detect the operative state of the same plug and adapted to generate signals indicative of the sparking at the plug, and further comprising switching means operatively connected to said first and second means, adapted to generate signals as a function of the signal delivered by said first means exclusively when no signals are generated by said second means.

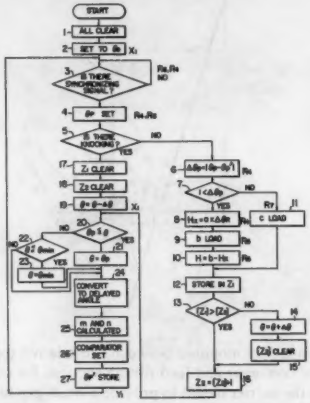
4,233,944
METHOD FOR CONTROLLING IGNITION TIMING OF INTERNAL COMBUSTION ENGINE

Norio Omori; Hideya Fujisawa, both of Kariya; Yutaka Kawashima, Okazaki; Hisasi Kawai, Toyohashi; Kazuo Iwase, Okazaki, and Masakazu Ninomiya, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan, part interest to each

Filed Jun. 12, 1979, Ser. No. 47,932
Claims priority, application Japan, Jul. 4, 1978, 53/81613
Int. Cl.[3] F02P *5/14*
U.S. Cl. 123—416 **2 Claims**

1. In a method for controlling the timing of ignition spark by repeating, in each rotation cycle of an output shaft of an internal combustion engine, the steps of detecting a presence and absence of knock of said internal combustion engine, and retarding and advancing the timing of ignition spark which is to be supplied in a current rotation cycle of said output shaft relative to the timing of ignition spark which was supplied in a preceding rotation cycle of said output shaft in response to respective outputs of said detection step indicative of said presence and absence of knock, the improvement comprising the steps of:

establishing a desired number of rotation cycles of said output shaft in response to the output of said detection step indicative of said absence of knock, said desired number being varied in accordance with operating conditions of said internal combustion engine;



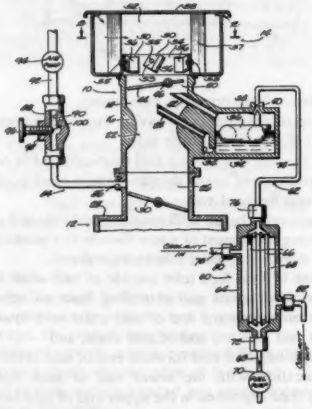
counting a number of rotation cycles of said output shaft in response to the detection output indicative of said absence of knock; and

holding, until the counted number of rotation cycles reaches the established desired number of rotation cycles, the timing of ignition spark which is to be supplied in said current rotation cycle of said output shaft unchanged from the timing of ignition spark which was supplied in said preceding rotation cycle.

4,233,945
CARBURETION IN AN INTERNAL COMBUSTION ENGINE

Elden W. Beitz, 262 Main St., Oakfield, Wis. 53065

Filed Sep. 21, 1978, Ser. No. 944,652
Int. Cl.[3] F02M *31/00*
U.S. Cl. 123—585 **11 Claims**



1. In an internal combustion engine including an intake

manifold, a carburetor having a carburetor body with a fluid flow passage therethrough, said passage including one end providing an air inlet and another end connected to said intake manifold, a choke plate positioned in said one end of said passage, means for providing for pivotal movement of said choke plate, means for controlling fluid flow through said passage including a throttle valve positioned in said another end, means for supplying fuel to the carburetor, and an air cleaner positioned on said carburetor body and including a central cylindrical cavity communicating with said air inlet, the improvement comprising in combination,

means for heating fuel supplied to said carburetor,

means for turbulating air flowing through said air inlet, said means for turbulating air flowing through said air inlet including a plurality of blades located in said central cylindrical cavity and adjacent said inlet opening upstream of said choke plate and spaced circumferentially around the periphery of said inlet opening, said blades each extending inwardly from said inlet opening periphery, and

means for injecting air into said fluid flow passage above said throttle valve and closely adjacent said throttle valve.

4,233,946

EXHAUST GAS RECIRCULATION SYSTEM

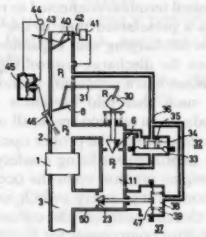
Keigo Yorioka, Ohbu, and Mikio Minoura, Nagoya, both of Japan, assignors to Aisan Industry Co., Ltd., Aichi, Japan

Filed Apr. 9, 1979, Ser. No. 28,765

Claims priority, application Japan, Apr. 25, 1978, 53-48830

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **1 Claim**



1. An exhaust gas recirculation system comprising an exhaust gas recirculating passage connecting the exhaust pipe and a portion of the intake pipe located downstream of the throttle valve, a pressure control valve provided in said passage, a variable constriction provided between said pressure control valve and intake pipe in operative connection to said throttle valve, and a pressure control valve operating means adapted to detect the pressure differential across said variable constriction and operat said pressure control valve in conformity to the detected pressure differential whereby the pressure differential across said variable constriction is maintained constant regardless of the opening of said variable constriction.

4,233,947

EXHAUST GAS RECIRCULATION SYSTEM HAVING A SOLENOID DUTY COMPENSATION CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE

Toshimi Abo, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

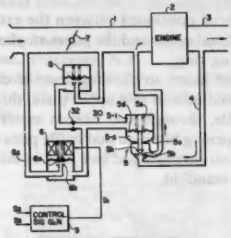
Filed Jul. 9, 1979, Ser. No. 55,758

Claims priority, application Japan, Aug. 25, 1978, 53-102949

Int. Cl.³ F02M *25/06*; F07B *3/00*

U.S. Cl. 123—571 **9 Claims**

1. An exhaust gas recirculation system for an internal combustion engine, including an electromagnetic valve which controls the recirculation rate of the exhaust gas in response to a driving pulse signal the duty cycle of which is controlled by an output signal of a computing circuit, said computing circuit producing said output signal in accordance with engine parameters, wherein the improvement comprises:



means for modifying the duty cycle of said driving pulse signal in accordance with the deviation of the voltage of said driving pulse signal from a predetermined value.

4,233,948

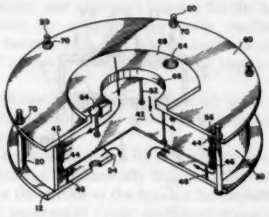
POLLUTION CONTROL DEVICE FOR AUTOMOBILE CARBURETION

David F. Cramrine, Okmulgee, Okla., assignor to Gaines L. Neal, Okmulgee, Okla., a part interest

Filed Apr. 16, 1979, Ser. No. 29,917

Int. Cl.³ F02M *29/00*

U.S. Cl. 123—590 **1 Claim**



1. For use with an international combustion engine having a carburetor and an intake manifold, a fuel vaporizer adapted to be interposed between the carburetor and the intake manifold, comprising:

a circular base plate having a lower surface and an upper surface, the lower surface adapted to rest on an intake manifold, the base plate having a central exit port therein;

a tubular spacing ring of outside diameter less than the diameter of the base plate, having a lower edge and an upper edge, the lower edge resting on the base plate upper surface;

a circular baffle plate of diameter less than the inner diameter of said spacing ring the baffle plate being positioned in the spacing ring providing an annular passageway therebetween, the baffle plate having an upper and lower surface;

an upright perforated tubular collar having a lower edge and an upper edge, the diameter of the perforated collar being less than the diameter of the baffle plate and less than the internal diameter of said spacing ring providing an annular space between the perforated collar and said spacing ring, the bottom edge of the perforated tubular collar resting on the upper baffle plate surface;

means of supporting said baffle plate above said base plate providing a passageway therebetween;

a circular upper plate having a lower surface and an upper surface, the lower surface being attached to the spacing ring upper edge and engaging said perforated collar upper edge, the upper surface of the upper plate adaptable to be

attached to a carburetor, the upper plate having a central inlet port therein, the base plate, baffle plate, perforated collar, spacing ring and trop plate being secured in axial alignment;

fibrous material positioned between the exterior cylindrical surface of said collar and the interior cylindrical surface of said spacing ring;

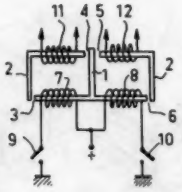
whereby fuel laden air flowing from a carburetor passes through said inlet in said upper plate, through said perforated baffle, through said fibrous material, through the annular opening between said baffle plate and said spacing ring and out through said exit port in said base plate into an intake manifold.

4,233,949

DEVICE FOR PRODUCING AND DISTRIBUTING HIGH TENSION TO THE SPARK PLUGS OF AN INTERNAL COMBUSTION ENGINE

Emmanuel J. Poirier d'Ange d'Orsay, Toulouse, France, assignor to Societe pour l'Equipement de Vehicules, Issy-les-Moulineaux, France

Filed Oct. 24, 1978, Ser. No. 954,319
Claims priority, application France, Oct. 27, 1977, 77 32449
Int. Cl.³ F02D *3/02*
U.S. Cl. 123—634 **17 Claims**



1. A device for the production and distribution of high tension current supply for the sparking plugs of an internal combustion engine, such device comprising:

(a) primary winding means comprising q_1 primary windings where q_1 is an integer at least equal to unity;

(b) secondary winding means comprising q_2 secondary windings where q_2 is an integer not less than two and at least as great as q_1;

(c) a low voltage supply to supply low voltge to said primary winding means;

(d) power switch means effective to connect said low voltage supply to and to disconnect said low voltage supply from the primary winding means;

(e) means connecting said secondary winding means to supply H.T. current from each of said secondary windings to a sparking plug of said internal combustion engine, there being at least as many sparking plugs as there are secondary windings;

(f) means providing a flux link between said primary winding means and said secondary winding means, said flux link means comprising a single magnetic circuit including at least two flux path frames having a common side, a secondary winding on a non-common side of each frame; and

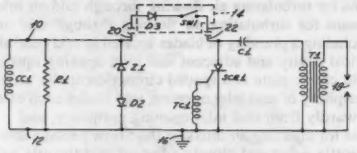
(g) respective means effective to at least partially suppress the magnetic flux in each of said flux paths, each of said flux paths being associated with at least one said primary winding, and at least one said means effective to at least partially suppress the flux in said flux path.

4,233,950

SAFETY INTERLOCK FOR AN ENGINE IGNITION SYSTEM

Kenneth L. Krolski, Cedarburg, Wis., and John N. MacLeod, Ann Arbor, Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 736,315, Oct. 28, 1976, abandoned.
This application Apr. 24, 1979, Ser. No. 32,870
Int. Cl.³ F02P *3/08, 1/08;* **F02B** *77/08*
U.S. Cl. 123—630 **12 Claims**



1. In an apparatus including an engine having a capacitor-discharge engine ignition system having a timing cycle including a first component consisting of a charge storage capacitor, means connected to charge said capacitor through a charge path, a second component consisting of a unidirectional current rectifier means connected in said charge path in series with said capacitor to block the discharge of said capacitor through said charge path in the absence of an unsafe condition, and a third component consisting of a discharge triggering means connected to said capacitor through a discharge path and having a control terminal connected to receive a discharge control signal at a preselected time in the timing cycle, said triggering means discharging said capacitor through the discharge path when the discharge control signal is received by said control terminal, spark producing means connected in said discharge path such that said capacitor discharges therethrough and produces an ignition spark, all of said components being inherently essential to the proper operation of said ignition system, the improvement being a safety interlock system for preventing engine ignition upon the occurrence of an unsafe condition comprising: safety switch means movable between open and closed conditions and connected to one of said first, second and third components for disabling said one component to function in said ignition system by electrically isolating said one component from said ignition system when said switch means is one of said open and closed conditions, said switch means and said one component being disposed within an integrally encapsulated structure located remote from the other said components, said switch means being in one of said open and closed conditions on the occurrence of a preselected unsafe condition of said apparatus to electrically isolate the inherently essential component from the ignition system and render the ignition system inoperative.

4,233,951

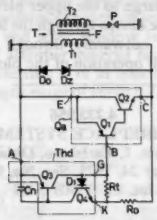
IGNITION CIRCUIT FOR INTERNAL COMBUSTION ENGINES

Hisao Take, Shizuoka, Japan, assignor to Kabushiki Kaisha Kyoritsu Seisakujo, Shizuoka, Japan

Filed Dec. 10, 1979, Ser. No. 102,234
Claims priority, application Japan, Dec. 18, 1978, 53/157766
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—625 **6 Claims**

1. An ignition circuit for internal combustion engines characterized in that a diode is connected in parallel to a primary winding of an ignition coil of a magneto, also a composite transistor circuit consisting of two transistors whose forward direction is directed in the reverse direction of said diode, is connected across said primary winding at its collector and emitter, a series circuit of a temperature compensating resistor and a resistor is connected between the base of said composite transistor circuit and one terminal of said primary winding, an

anode-cathode path of a thyristor-equivalent circuit in which a collector of a PNP transistor is connected to a base of an NPN transistor and the base of said PNP transistor is connected to the collector of said NPN transistor, is connected between the junction of said temperature compensating resistor and said



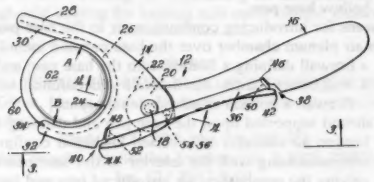
resistor and the other terminal of said primary winding, and the gate of said thyristor-equivalent circuit is connected to the base of said composite transistor circuit so that the gate current of said thyristor-equivalent circuit may be fed by the voltage drop across said temperature compensating resistor.

4,233,952

HAND CATAPULT DEVICE

John A. Perkins, Portage, Mich., assignor to Perky & Me Co., Battle Creek, Mich.

Filed Mar. 30, 1978, Ser. No. 891,614
Int. Cl.³ F41B *3/00*
U.S. Cl. 124—5 **10 Claims**



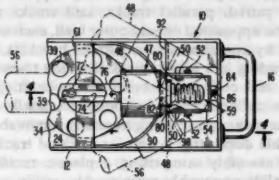
1. A hand catapult device for throwing a flying disc which comprises a yoke constructed of semirigid plastic material pivotally connected to a handle for movement through an angle of not more than about 45 degrees to each side of the longitudinal center line of said handle, said yoke comprising an inner circumferentially channeled, semicircular portion conforming to and adapted to receive said disc and having a long complementarily channeled arm projecting tangentially from one terminus of said semicircular portion and a short complementarily channeled arm projecting circumferentially from the other terminus of said semicircular portion and being stationary relative to said long arm, said short arm projecting a distance just sufficient to offer resistance to the insertion and withdrawal of a disc in the channeled semicircular portion, biasing means for biasing said yoke to the short-arm side of the center line in the uncocked position, and pressure-releasable means for holding said yoke in a position whereby the yoke is on the other side of the long-arm side of the center line in the cocked position, said pressure releasable means being adjusted to be released by the pressure engendered thereon by the tendency of said yoke to rotate from the cocked toward the uncocked position when it is swung in an arc by a person grasping said handle.

4,233,953

PROPULSION DEVICE FOR TENNIS BALLS AND LIKE SPHERICAL OBJECTS HAVING AN IMPROVED PROGRAMMED DISCHARGE OF THE OSCILLATORY TYPE

C. Malcolm Bash, Trenton, N.J., assignor to Prince Manufacturing Co., Inc., Princeton, N.J.

Filed Oct. 30, 1978, Ser. No. 955,852
Int. Cl.³ F41F *1/04*; A63B *69/38*
U.S. Cl. 124—56 **12 Claims**



1. In a propulsion device for spherical objects, said device being of the type including a portable housing having propulsion means and a hopper for said objects, a rotary distributor adapted to feed a selected number of said objects in successively following order during each rotation of the distributor through a 360° cycle, a tubular receiver into which said objects are fed from the distributor, means for driving the distributor, barrel means communicating with the receiver and providing an outlet through which said objects are discharged by the propulsion means, and a support bracket for the barrel means, an improvement for programming cyclic oscillatory movements of the barrel means as a wholly mechanical function of the rotational cycles of the distributor, the improvement comprising:

(a) means mounting the support bracket upon the housing for oscillating movement about an axis having a vertical component; and

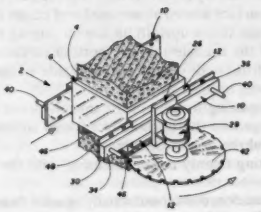
(b) motion-translating means formed wholly as a mechanical driving linkage mechanically driven by the distributor and extending therefrom to the bracket for imparting a predetermined quantum of cyclic oscillatory travel to the barrel means for every cycle of rotation of the distributor, whereby to propel through the barrel means, during the quantum of cyclic oscillatory motion thereof established through the driving linkage, a number of objects equal to the number thereof fed from the distributor during a single rotational cycle thereof.

4,233,954

CONCRETE PILE CUTTING DEVICE

Frederick J. Visser, Glen Rock, N.J., assignor to Von Rohr Equipment Corp., Bloomfield, N.J., a part interest

Filed Feb. 26, 1979, Ser. No. 15,022
Int. Cl.³ B28D *1/04*
U.S. Cl. 125—14 **16 Claims**



1. A portable device for cutting a concrete pile which comprises:

a collar adapted for annular supported disposition about said concrete pile, said collar comprising an outer wall defining a tunnel for the reception of said concrete pile, said wall possessing a discontinuous cross-sectional circumference that defines an opening for the lateral placement of said collar about said pile, said collar further comprising closure means attached to said wall for securing said collar in tensioned abutment with the outer surface of said pile;

means attached to said collar for the support of a pile cutting assembly, said pile cutting assembly support means comprising paired, parallel tracks, said tracks mounted in diametric opposition on said outer wall, each of said tracks defined by complementary, parallel brackets, said brackets extending in a longitudinal direction transverse to the axis of said collar, said brackets cooperating with said collar to define in cross-section an essentially C-shape;

at least one planar pile cutting assembly removably mounted in slidable disposition within one of said tracks, said pile cutting assembly comprising a planar, rectilinearly extended slide removably reciprocable within said tracks, a cutting means platform disposed medially along said slide to receive and hold a cutting means in fixed disposition thereon, and a cutting means comprising a rotating circular saw disposed in spaced-apart relation to said collar and adapted to form a cut in said pile having a depth less than the thickness of said pile,

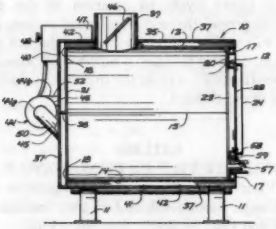
wherein said pile cutting assembly is free to pass through said track, and is removable therefrom, and said cutting means passes tangentially adjacent said pile and forms a cut in said pile generally transverse and perpendicular to the longitudinal axis thereof.

4,233,955

FIREPLACE AND ROOM HEATER

Gerald McCallum, Box 6083 Hillyard Stn., Spokane, Wash. 99207, and Dale A. McCallum, S. 402 McKinnon, Spokane, Wash. 99206

Filed Oct. 10, 1978, Ser. No. 950,139
Int. Cl.[3] F24C *1/14;* F24B *3/00*
U.S. Cl. 126—61 **6 Claims**



1. A fireplace and room heater, comprising:

a firebox defined by (a) an arcuate top surface, (b) an arcuate bottom surface joined at opposed end edges to the arcuate top surface, (c) an upright back wall joining rearward side edges of the arcuate top and bottom surfaces, and (d) an upright front wall joining forward side edges of the arcuate top and bottom surfaces;

an access opening formed in the upright front wall;

a door hinged to the upright front wall operable to selectively seal the access opening;

a flue opening openly communicating with the firebox interior;

a partially enclosed shell outwardly spaced from the upright back wall and the top and bottom surfaces and defining a forwardly facing opening surrounding the periphery of the upright front wall;

a transverse solid bulkhead extending between the shell and firebox, dividing the space between the shell and the firebox into an upper and a lower plenum chamber;

blower means having an air intake for drawing air inwardly and an air discharge for forcing air outwardly; and

duct means openly connecting the air intake of the blower means to the lower plenum chamber and openly connecting the air discharge to the upper plenum chamber;

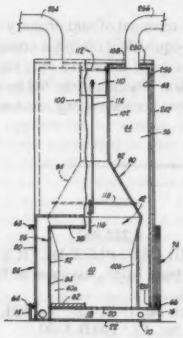
whereby air may be drawn through the lower plenum chamber and forced outwardly through the upper plenum chamber through operation of the blower means.

4,233,956

FIREPLACE SYSTEM

Freddie J. Haynes, Rte. 1, Earlsboro, Okla. 74840

Filed May 24, 1978, Ser. No. 909,290
Int. Cl.[3] F24B *7/00*
U.S. Cl. 126—121 **16 Claims**



1. A fireplace system comprising:

a hollow base pan;

means for introducing combustion air to the base pan;

an air plenum chamber over the base pan and including:

a firewall defining a firebox with the base pan; and

a wall spaced from the firewall and defining with the firewall a portion of an air plenum space;

a shroud supported upon the base pan and defining a combustion air chamber of inverted U-shaped configuration communicating with the interior of the base pan for receiving the combustion air introduced into said base pan, said shroud including a pair of opposed legs extending vertically from the base pan on opposite sides of a fireplace opening;

outlet means in said legs for directing air into said firebox;

a stack extending upwardly from said firebox and surrounded by said air plenum space;

wall means spaced from said wall of said air plenum and defining a moving air insulation zone around said air plenum chamber; said wall of said air plenum having an opening at its upper and lower portion for moving air to and from said air insulation zone; and

a damper means including a damper plate at an elevated location is said stack at a vertical level substantially even with the top of said air plenum chamber.

4,233,957

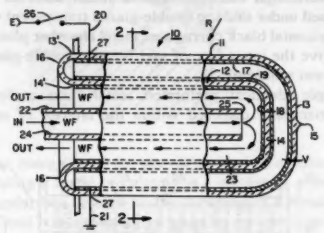
SOLAR ENERGY COLLECTOR

Neal S. Kenny, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,226
Int. Cl.[2] F24V *3/02*
U.S. Cl. 126—443 **7 Claims**

1. A solar energy collector operative to produce thermal energy under impinging solar radiation wherein, an absorber

substrate in the form of a tubular member is disposed in spaced relation within a solar window in the form of an outer tubular member, a space between said inner and outer tubular members being evacuated to a selected partial pressure, means for introducing working fluid within the inner tubular member in heat exchange relation with the absorber substrate via an open end of said inner tubular member wherein the improvement comprises: composite coatings disposed on selected surfaces of said absorber substrate and solar window including: an absorber coating of selected absorber material having a relatively high absorptivity characteristic α of at least 0.8, to solar radiation within the wavelength range of about 0.2 micrometers to about



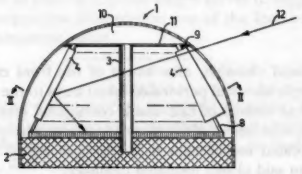
2.0 micrometers, and an emittance reducing coating having a relatively low emissivity characteristic ϵ for infrared radiation within the wavelength range of about 2.0 micrometers to about 20 micrometers deposited on at least one surface of said inner tubular member to surround said absorber coating, said yielding an emissivity characteristic ϵ for the absorber of at most 0.3 in said infrared range; and an electrically conductive window coating disposed on at least one surface of said outer tubular member, said solar window coating having a relatively low emissivity characteristic ϵ therefor of at most 0.3 within said aforementioned infrared range, and means operatively coupled to said window coating for conducting an electrical current through said coating for heating said outer tubular member.

4,233,958

CLIMATE-CONTROLLED BUILDING CONSTRUCTION

Carl-Göran Heden, Solna Kyrkväg 11, S-104 01 Stockholm, Sweden

Filed Jul. 6, 1978, Ser. No. 922,432
Claims priority, application Sweden, Jul. 7, 1977, 7707943
Int. Cl.³ F24J 3/02
U.S. Cl. 126—424 **1 Claim**



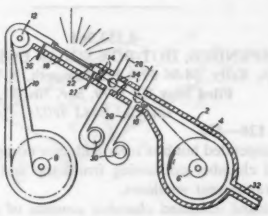
1. Device for carrying out climate control in a building, comprising a heat storage chamber (2), a dome (1) built on top of it with a transparent outer shell (25, 22) and an inner shell composed of flat cassettes (4) rotatably arranged to be able to screen off incident light radiation to a greater or lesser degree in the dome (1) and the escape of light therefrom, there being for heat exchange between the heat storage chamber (2) and the dome (1) a central tube (3) from the heat storage chamber (2) to an upper connecting space (10) in the top of the dome, a hollow, upper axle (9) on each cassette (4) opening into the connecting space (10) and a lower, open end surface on each cassette (4) opening into the dome, the outer shell being made up of an outer layer (25) and an inner layer (22), at least the inner layer being composed of flat plastic containers (22) arranged with an upper and a lower corner, said corners having openings for connection to connecting hoses (26) and adjacent columns of plastic containers (22) being pairwise connected together with connecting hoses (26) to closed circulation loops, said dome (1) being made up of a frame of aluminum beams (20) and strips (24) having grooves (21) in which the plastic containers (22) and the plastic sheets (25) are clamped with plastic moldings (23), said aluminum beams (20) being held together with star-shaped connecting members (30) to form an approximately hemispherical dome frame with a honeycomb structure, said cassettes (4) having a shiny, reflecting side surface (5) and a black, heat-absorbing side surface (6) and being mounted substantially vertically and being rotatable on two axles (8, 9) of which at least the upper axle (9) is hollow and connects the interior of the cassette to the connecting space (10), while the bottom of the cassette is open and in free communication with the dome, a gear (40) controlling the setting of the cassettes on the lower axle (8) of the cassette, a chain (41) running over and in engagement with the gears (40) of all the cassettes and a motor for driving the chain (41) synchronically with the movement of the sun, a magnetic device to move a guide cylinder (45) vertically, a pin (47) on the lower axle (8) of the cassette, which pin can be acted on by the guide cylinder (45), a toothed coupling (42, 48) between the cassette axle (8) and the gear (40) to fix different positions with 90° between them between the gear and the cassette axle when the guide cylinder (45) acts on the axle pin (47), and a chain (43) for triggering the action of the guide cylinder (45), the last-named said chain (45) moving synchronically with the first-named said chain (41).

4,233,959

STORAGE OF THERMAL ENERGY

William R. Laws, Worcester Park, and Geoffrey R. Reed, Tadworth, both of England, assignors to Encomech Engineering Services Ltd., Epsom, England

Filed Feb. 26, 1979, Ser. No. 15,042
Claims priority, application United Kingdom, Feb. 27, 1978, 7752/78
Int. Cl.³ F24J 3/02
U.S. Cl. 126—426 **9 Claims**



1. A thermal energy storage apparatus comprising a heat-insulated casing, an elongate flexible heat storage member within the casing, respective rotary mounting members at spaced positions within the casing, opposite ends of the flexible member being attached to the respective mounting members, a path for said flexible member extending within the casing between said mounting members, and drive means connected to said mounting members for rotating said members to displace the flexible member through the casing interior along said path in either direction alternatively to coil the flexible member on either of said mounting members selectively, means disposed in the path of the member at a region intermediate the respective mounting members for the passage of heat from the exterior to said flexible member within the casing as it is progressively passed along said path by said drive means, the thermal energy received by the flexible member being stored in

the member while it is collected in the form of a coil on one of said mounting members, and means for the extraction of stored heat from the flexible member comprising inlet and outlet fluid connections to and from the casing and fluid passage means within the casing between said connections for the flow of heat transfer fluid over the flexible member to be heated by said member, said fluid passage means being disposed in the path of the member intermediate the respective mounting members for contact with said flexible member between the mounting members as the flexible member is progressively passed along said path by the drive means.

4,233,960

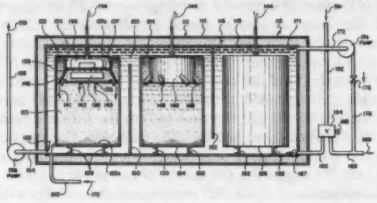
HEAT STORAGE APPARATUS AND METHOD

Steven A. Johnson, 136 N. First West, Preston, Id. 83772

Filed Jul. 21, 1978, Ser. No. 926,680

Int. Cl.[3] **F24J** *3/02;* **F24H** *7/00;* **B01F** *9/00*

U.S. Cl. 126—430 **15 Claims**



1. A heat storage apparatus comprising:

a heat storage medium having a latent heat of reaction as the primary heat storage mechanism;

container means for the heat storage medium;

mixing means in the container comprising a rotatable impeller magnetically coupled to a stator outside of said container for mixing the heat storage medium to inhibit stratification of the heat storage medium;

enclosure means for insulatively enclosing the container means; and

heat transfer means for exchanging heat energy with the heat storage medium.

4,233,961

SUSPENDED, HOT-BOX SOLAR COLLECTORS

Donald A. Kelly, 58-06 69th Pl., Maspeth, N.Y. 11378

Filed May 10, 1979, Ser. No. 37,767

Int. Cl.[3] **F24J** *3/02*

U.S. Cl. 126—436 **10 Claims**

1. A suspended hot box solar collector comprised of a closed insulated chamber containing front, top and bottom double-glazed transparent windows,

said closed insulated chamber consists of an angular truncated triangular cross section shape which is constructed in any convenient modular length,

said closed insulated chamber is elevated approximately one-third of its total height by four corner posts which are integral with the said closed insulated chamber,

a fixed horizontal reflective surface disposed directly under said closed insulated chamber at base level in a southerly direction in front of said suspended hot box solar collector to a distance nearly equal to one-third the total height of said closed insulated chamber,

a three plane reflective element disposed at the rear bottom of said closed insulated chamber with the lower front edge secured to said fixed horizontal reflective surface,

the opposite top edge of said three plane reflective element angled upward toward the rear lower face of said bottom double glazed transparent window,

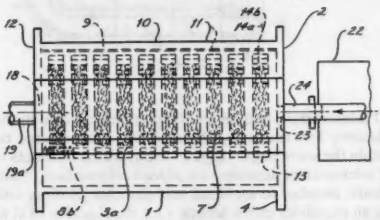
an adjustable top reflective surface disposed at an adjustable angle at the rear top northern edge of said top double-glazed transparent window,

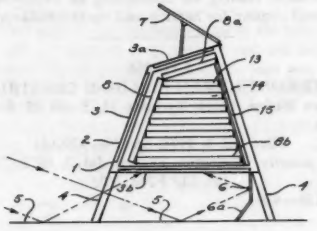
a continuous piano type hinge secured at the rear top northern edge of said top double-glazed transparent window and the underside of said adjustable top reflective surface,

twin support rods secured at the sides of said adjustable top reflective surface and fastened to the upper sides of said closed insulated chamber by means of twin locking screws, adjustment means for said twin support rods within said twin locking screws,

a black corrugated metal absorber plate disposed behind the rear face of said front double-glazed transparent window, a horizontal black corrugated metal absorber plate disposed under said top double-glazed transparent window, a horizontal black corrugated metal absorber plate disposed above the inner face of said bottom double-glazed transparent window,

multiple identical perforated metal trays uniformly and horizontally disposed within the interior of said closed





insulated chamber, attachment of the front ends of said multiple identical perforated metal trays to the rear nearly vertical surface of said black corrugated metal absorber plate, attachment of the rear ends of said multiple identical perforated metal trays to a rear metal grid framework within said closed insulated chamber,

eutectic salts uniformly dispersed within each of said multiple identical perforated metal trays,

an inlet air port disposed at the lower rear corner of said closed insulated chamber,

an outlet hot air port disposed at the upper side of said closed insulated chamber opposite from said inlet air port,

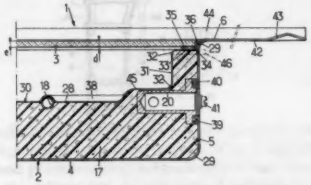
a motor driven fan disposed in line with said outlet hot air port on the inside of said closed insulated chamber,

multiple small D.C. motor driven fans uniformly disposed within said closed insulated chamber, multiple silicon photovoltaic solar cells mounted along the outside front strip surfaces of said closed insulated chamber, to power said multiple small D.C. motor driven fans.

4,233,962
PANELS FOR COLLECTING SOLAR ENERGY

Michel Nény, Paris, France, assignor to Societe d'Investissement pour le Developpement des Appareils Menagers, Montrouge, France

Filed Apr. 18, 1978, Ser. No. 897,547
Claims priority, application France, Apr. 20, 1977, 77 11894
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 16 Claims



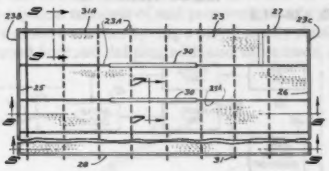
1. A solar energy panel for providing heat from solar radiation by heating a liquid circulating in a section of piping in a flat rectangular box formed by the stamping of a metal sheet,
wherein said box is thermally closed by a cover transparent to solar radiation, and
said piping section is in intimate contact in said box with a plate comprised of thermally conductive material disposed in said box parallel to the bottom of said box, and
wherein said plate is separated from the bottom of said box by an insulating pad,
said plate forming a tray having diverging side walls that is formed by stamping a thermally conductive metal sheet to a configuration that is less deep than said rectangular box,
wherein the side walls of said tray are extended towards the exterior by rims parallel to the bottom of said tray and supporting by themselves a transparent cover, the edge of said rims maintaining a space from the wall of said box, wherein said space is filled with a thermally insulating material, and
wherein the side walls of said box are extended towards the exterior by flat rims parallel to the bottom of said box and the rims of said tray are off-set, relative to said flat rims of said box, by a distance d that is slightly greater than the thickness of said transparent cover, and
wherein said box has at each of its four corners a recessed step delimited externally by a flat ledge, of generally triangular or analogous form, off-set by the distance d towards the bottom of said box relative to said flat rims of said box so that each of said ledges serves to support with the interposition of insulation one of the four corners of said transparent cover.

4,233,963
SOLAR HEAT COLLECTOR SYSTEM HAVING MEANS TO ACCOMMODATE THERMAL EXPANSION

Frank D. Werner, Jackson, Wyo., assignor to Park Energy Company, Jackson, Wyo.

Filed Sep. 21, 1978, Ser. No. 944,638
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 5 Claims

1. A large scale heat collecting system comprising:
a first duct having an elongated central axis;
a plurality of laterally extending ducts having axes extending generally transverse to said first mentioned duct and having first portions on the interior of said lateral ducts in fluid communication with the interior of said first duct;
a radiant energy collector mounted on each of said lateral ducts, each of said radiant energy collectors comprising;
a frame member having spaced side supports and spaced end supports defining a perimeter,
a plurality of elongated strips of perforated sheet material positioned side by side to form a large surface area within the perimeter of said frame member,
means on said frame member to support said strips of sheet material comprising means to fasten said strips of sheet material adjacent first ends thereof to one of the end members of said frame member, and a plurality of resilient members coupled between the other of said end members of said frame member and the opposite ends of each of said strips of sheet material to maintain tension in said strips of sheet material, and

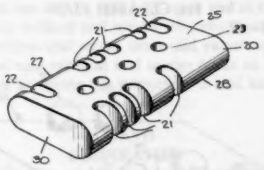


cable means attached to and extending between the side supports of said frame member so that the cable means extend across the lateral width of said strips;
means to cause fluid flow from said laterally extending ducts into said first duct; and
air intake means in each laterally extending duct positioned so that fluid flows through said perforated sheet material in its path of movement from said air intake means to said first duct.

4,233,964
INTERNALLY READABLE IDENTIFYING TAG

Keith B. Jefferts, and Elaine R. Jefferts, both of P.O. Box 425, Shaw Island, Wash. 98286

Continuation-in-part of Ser. No. 845,944, Oct. 27, 1977, abandoned, which is a continuation of Ser. No. 671,530, Mar. 29, 1976, abandoned. This application May 12, 1978, Ser. No. 905,540
Int. Cl.³ G09F 3/00
U.S. Cl. 128—1 R 7 Claims



1. An identifying tag for implanting in small animals including fish to aid in determining the movement thereof from one habitat to another and which is identifiable by means of X-ray equipment, which comprises a solid one piece generally uniformly shaped metallic elongated member being of a length sufficiently small so as to render said member suitable for implantation into an animal, said metallic member having a substantially oblong cross-sectional shape to facilitate orientation of said tag when implanted in said animal and a longitudinal length significantly greater than the maximum cross-sectional width thereof suitable for maintaining sufficient data storage capacity on said tag, said metallic elongated member having cut in its outer surface a plurality of spaced grooves at least some of which extend only partially about the non-circular peripheral surface of said elongated member to form a predetermined fixed format binary coding system which includes an indexing means to define the reading direction of the coded grooves, said grooves being of a sufficient depth such

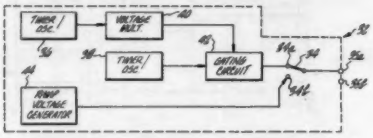
that in profile each of said grooves is readily identifiable as being transparent as distinguished from opaque by means of X-ray equipment while said tag remains implanted in said animal.

4,233,965

METHOD AND APPARATUS FOR THE THERAPEUTIC TREATMENT OF LIVING TISSUE

Everitt E. Fairbanks, Arleta, Calif., assignor to CAS Products, Inc., Los Angeles, Calif.

Filed Jan. 16, 1978, Ser. No. 869,624
Int. Cl.³ A61N *1/42*
U.S. Cl. 128—1.5 **27 Claims**



1. A method for the therapeutic treatment of living tissue comprising the steps of

generating a series of rectangular, positive electrical pulses of predetermined amplitude, frequency, and duration,

generating a magnetic field,

positioning a first electrode and a second electrode against the tissue to be stimulated,

applying said electrical pulses to said tissue through said first electrode,

applying said magnetic field in the area of said first electrode and substantially at right angles to the surface of said tissue to aid the penetration of said electrical pulses into said tissue, and

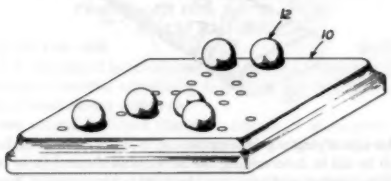
providing an electrical return path from said tissue through said second electrode.

4,233,966

APPLIANCE FOR USE IN ACUPRESSURE THERAPY

George K. Takahashi, 2604 Kelton Ave., Los Angeles, Calif. 90064

Filed Dec. 11, 1978, Ser. No. 968,496
Int. Cl.³ A61H *15/00*
U.S. Cl. 128—67 **1 Claim**



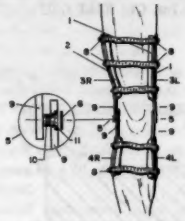
1. An appliance for use in practicing finger pressure therapy, in combination, a first rigid substantially planar member adapted for positioning in proximity to a portion of the human body, a plurality of substantially spherical knob members, said members having stem portions adapting them for fixed securement to said first member, said first member having a pair of groups of openings for receiving said stem portions, said groups being arranged symmetrically on said first member and the openings of one group comprising a generally J-shaped array of openings arranged in mirror-image relation to the openings of the other group with the hook portion of each array extending away from each other and the stems of the arrays being generally parallel.

4,233,967

CUSTOM-FITTED KNEE GUARD AND BRACE

Roy B. Daniell, Jr., 2026 "B" Tycoon Rd., Chamblee, Ga. 30341

Filed Apr. 17, 1978, Ser. No. 896,990
Int. Cl.³ A61F *5/00*
U.S. Cl. 128—80 C **2 Claims**



1. A knee guard and brace, which comprises: inside and outside members which are adapted to fit on the inner and outer sides, respectively, of a wearer's leg, each side member comprising a pair of thigh and calf support members; each support member having a rib which runs parallel to the wearer's leg from the knee joint to substantially the distal edges of the support member; means pivotally interconnecting the end portions of the ribs in overlapping engagement; each support member having a pair of semi-rigid flanges which extend laterally from opposite sides of the rib, the flanges being wholly disposed within the portions of the thigh and calf support members which are located above and below the segments of the knee joint at the sides of the knee cap, respectively; a section of each rib disposed between the overlapping end portions and the proximate edges of the flanges being curved, the radius of curvature of the section being such that an arch is formed which longitudinally spans the area of the knee joint at the side of the knee cap when the end portions are interconnected in overlapping engagement, the arch being entirely disposed laterally from the surface of the knee, so that the force of a blow upon the knee guard and brace received at the knee joint tends to be dissipated to the large muscles of the wearer's thigh and calf rather than absorbed by the knee joint; the flanges of the outside member having a plurality of laterally extending straps connecting the upper flanges to each other and the lower flanges to each other, portions of the straps being contiguous with the flanges, the straps having a plurality of equally spaced holes; a plurality of studs attached to the flanges of both the inside and outside members, the studs being aligned with an equal number of holes in the contiguous portions of the straps, and the studs having the same diameter at the interface between the studs and the flanges are the diameter of the holes, so that the straps can be seated over the studs, securing the knee guard and brace and encasing a wearer's leg above and below the knee; the support members being constructed of a thermoplastic material which becomes pliable, upon heating, at temperatures which are sufficiently low that the flanges can be shaped to the contour of a heat protected leg, thereby enabling the knee guard and brace to form a custom-fitted, simi-rigid encasement which inhibits torsional twisting of the leg.

4,233,968

IUD ARRANGEMENT

Seth T. Shaw, Jr., 30036 Via Borica, Rancho Palos Verdes, Calif. 90274

Filed Jul. 26, 1978, Ser. No. 928,093
Int. Cl.³ A61F *5/46*
U.S. Cl. 128—130 **32 Claims**

1. In an intrauterine device of the type insertable in the uterus and having a surface contacting the uterus and first walls defining a fluid receiving cavity in at least a portion thereof, the improvement comprising, in combination:

one of a concentrated fluid solution and suspension of a drug in said cavity and said drug of the type providing an antifibrinolytic, an antifertility and an antiproteolytic effect and said drug comprising an amidine; and

said first walls of said intrauterine device comprising a polymer having a predetermined permeability to said drug, whereby, said predetermined permeability of said first walls controls the release rate of said drug from said cavity.

4,233,969

WOUND DRESSING MATERIALS

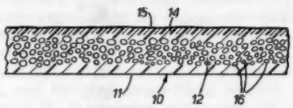
Peter M. Lock, 327 Lordswood La., Petrosa, Walderslade, Chatham, Kent, and David R. Webb, 9 Lambourn Way, Lordwood, Chatham, Kent, both of England

Filed Nov. 10, 1977, Ser. No. 850,375

Claims priority, application United Kingdom, Nov. 11, 1976, 47074/76

Int. Cl.[3] A61L *15/00*

U.S. Cl. 128—156 10 Claims



1. A wound dressing material, comprising a non-laminated sheet of a synthetic plastics material which is permeable to water vapour and to air and which is impermeable to liquid exudate, said material having on one side a smooth glazed surface for application to a wound, a closed cell cellular region behind the smooth surface, and a more dense region behind the closed cell cellular region, so that on contact with liquid exudate from a wound the dressing material will absorb a limited amount of exudate but prevent it from passing through the dressing material.

4,233,970

EMERGENCY ESCAPE BREATHING APPARATUS

Max L. Kranz, Brea, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 883,362, Mar. 6, 1978. This application Nov. 16, 1978, Ser. No. 961,291

Int. Cl.[3] A62B *7/02*

U.S. Cl. 128—201.28 4 Claims

1. Breathing apparatus comprising:

a protective hood for fitting about the head of a wearer and for containing an atmosphere of breathing gas, the base of said hood including an elastomeric neck closure adapted to admit the head of the wearer and yieldably seal in a stretched state against the neck of the wearer whereby said neck closure serves as an exhalation valve;

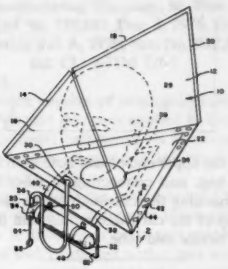
a supply bottle for providing breathing gas for said hood, said supply bottle having a threaded neck; and

flow regulating gas supply valve means including:

(a) a valve body having an internally threaded first bore for engagement with said threaded neck of said supply bottle to receive breathing gas therefrom, said valve body further having means, including an elongated internally threaded receptacle having an outlet port adjacent its inner extremity, for conveying breathing gas to said hood;

(b) a valve insert member threadably received in said receptacle and including at its inner extremity a first chamber in communication with said first bore, said insert member defining with said valve body a second chamber in communication with said outlet port, said valve insert member including an elongated second bore, a pressure control passage extending between said first chamber and said second bore, and a flow control orifice extending between said second chamber and said second bore, the inner end wall of said second bore mounting a valve seat surrounding the adjacent terminus of said pressure control passage;

(c) a valve closure member having a piston axially slidable in said second bore and defining with said valve insert member a third chamber in communication with said pressure control passage and said flow control orifice, said piston mounting resilient seal means confronting said valve seat;



(d) first bias means biasing said valve closure member to urge said resilient seal means against said valve seat to seal said pressure control passage;

(e) a ball valve in said first chamber;

(f) second bias means tending to urge said ball valve against the adjacent terminus of said pressure control passage to substantially but not completely block the flow of breathing gas through said pressure control passage; and

(g) a pin axially slidable in said pressure control passage and engaged at one end by said ball valve and at the opposite end by said resilient seal means whereby, upon unseating of said resilient seal means from said valve seat, the axial position of said resilient seal means tends to control the pressure of breathing gas conveyed to said hood.

4,233,971

RESPIRATOR

Manfred Gronau; Werner Mascher, and Klaus Pampuch, all of Berlin, Fed. Rep. of Germany, assignors to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,732

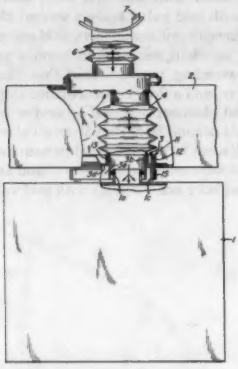
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1978, 2827079

Int. Cl.[3] A62B *7/08*

U.S. Cl. 128—202.26 5 Claims

1. A respirator comprising a breathing bag with an opening in its bottom, a rigid ring-shape connecting member inside the bag at said opening, an elastic sleeve encircling and tightly engaging said connecting member inside the bag, said sleeve being secured to the bag around said bag opening and projecting downwardly out of the bag, said connecting member having a base provided with an opening therethrough, a tubular member rigidly disposed in said base opening and extending above and below it, a chemical cartridge below said bag provided with an upwardly extending ring-shape flange projecting up into said elastic sleeve in sealing engagement therewith,

the top of the cartridge within said flange having an inlet opening therein, a rigid tube extending from said inlet opening up into concentric relation with the lower end of said tubular member, a breathing hose inside the bag having a lower end connected to the upper end of said tubular member, and means



for connecting the upper end of said hose with a breathing hose outside of the bag, said connecting member base being provided with an opening therethrough beside said tubular member, and the top of the cartridge within said flange having an outlet opening beside said tube.

4,233,972

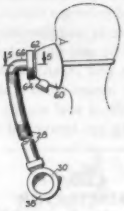
PORTABLE AIR FILTERING AND BREATHING ASSIST DEVICE

Wolfgang Hauff, 235 Keith Rd., West Vancouver, B.C., Canada, and John W. Tidland, 2084 SW. Linnell, Roseburg, Oreg. 97470

Continuation-in-part of Ser. No. 801,655, May 31, 1977, abandoned. This application May 8, 1978, Ser. No. 903,925

Int. Cl.³ A62B *7/10*

U.S. Cl. 128—205.12 **2 Claims**



1. A portable air filtering and breathing assist device comprising

(a) a housing having at least one threaded open end,

(b) perforated threaded cap means removably mounted on the open end of said housing,

(c) filter disc means removably mounted in said cap means,

(d) an outlet on said housing,

(e) a flexible hose having one end connected to said outlet,

(f) power means in said housing,

(g) a blower in said housing driven by said power means,

(h) means in said housing establishing communication of said blower with said perforated cap means and with said outlet whereby said blower is arranged to draw in air to be filtered through said perforated cap means and discharge it out said outlet,

(i) means on said housing arranged to attach it to the body of a person in spaced relation from the head,

(j) a face mask adapted to be worn by a person,

(k) and means on said flexible hose arranged to removably attach the other end thereof to said face mask,

(l) said hose being of a length to extend from such a face mask to the housing when worn by a person at a place spaced from the head,

(m) said respirator mask having an internally threaded front projection and a hollow adapter member with first and second exterior threaded portions, the said first threaded portion being threadedly engaged with said projection, and a threaded cap removably mounted on said projection, said means removably attaching said other end of said flexible hose to the mask including an elbow portion having a swivel connection to said threaded cap and a removable connection to said flexible hose.

4,233,973

APPARATUS FOR ADMINISTERING INTRAVENOUS DRUGS

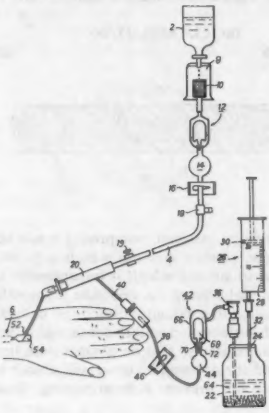
Vishnu S. Shukla, c/o Newcastle General Hospital, Department of Radiation and Oncology, Westgate Rd., Newcastle upon Tyne NE4 6BE, England

Filed May 9, 1979, Ser. No. 37,957

Claims priority, application United Kingdom, May 12, 1978, 19155/78

Int. Cl.³ A61M *5/00*; A61J *1/00*

U.S. Cl. 128—214 R **10 Claims**



1. Apparatus for administering intravenously a drug supplied in powdery form, the apparatus comprising an intravenous infusion set having a drip feed including a venipuncture member for feeding intravenous liquid into a patient's vein, a sealed container for the powdery drug, pump means for controlling the flow of fluid to and from the sealed container, said pump means including a piston-cylinder assembly, the cylinder of which is in communication with the upper regions of the sealed container, and a tubular member extending from the lower regions of said container to communicate into the drip feed of the intravenous liquid to the patient, the arrangement being such that withdrawal of the piston in the cylinder of the pump means partially evacuates the sealed container, the removed gaseous content of said container being replaced by intravenous liquid fed under gravity from the infusion set to dissolve the powdery drug into solution, controlled return movement of the piston in the cylinder of the pump means forcing a controlled volume of solution from the sealed container through the tubular member to the infusion set whereby said solution, together with the intravenous liquid from the infusion set, is fed by the venipuncture member to the patient.

4,233,974
SPINAL NEEDLE ASSEMBLY

Vince Desecki, Ingleside, and Carl Filipowicz, Lindenhurst, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

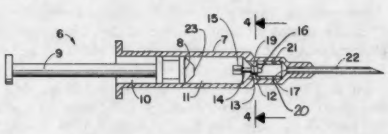
Filed Sep. 5, 1978, Ser. No. 939,851
Int. Cl.³ A61M 5/00
U.S. Cl. 128—215 **5 Claims**

1. A spinal needle assembly in which an obturator having an end cap extends into a cannula having a needle bevel at one end and a hub at the opposite end for engagement with said end cap, and means for aligning the obturator and the cannula, the improvement comprising means for bridging said end cap and hub to prevent relative axial movement between said obturator and cannula, said bridging means being adapted for rapid manual removal by an operator and comprising a molded overcap which overlies said end cap and extends over protruding portions of said end cap and hub.

4,233,975
ANTI-DRUG ABUSE SINGLE-USE SYRINGE

Arthur J. Yerman, 123 William Cook Blvd., Manahawkin, N.J. 08050

Filed Oct. 4, 1978, Ser. No. 948,532
Int. Cl.³ A61M 5/00
U.S. Cl. 128—218 P **3 Claims**



1. A single-use syringe comprising in combination: a tubular element having a plunger reciprocatably mounted in a first open end to tubular space of the tubular element and having an injection needle operably mounted on a remaining opposite end of the tubular element, a hollow portion of needle through-space being in flow communication with tubular space of the tubular element, the improvement being at least one of (a) an interior wall of the tubular element and (b) a circumscribing lengthwise-wall of the plunger, including a male member and the other thereof including a female member preventing retraction of a terminal end-portion of the plunger when the plunger is inserted within the tubular space sufficiently for the male member to become aligned with the female member, at least one of the male member and the female member being movable such that the male member is lockable into the female member, whereby a non-reusable syringe results preventing refilling or reinjection in use thereof, said plunger including a terminal end that blocks further outflow of syringe contents when said male member is mated with said female member, and said plunger including a separable proximal end jointly movably axially to and fro prior to and until said male member is mated with said female member, said proximal end being detachable from said terminal end when withdrawal pressure is applied to said proximal end after the male member is mated with the female member whereby the terminal end continues to block outflow of syringe contents when an effort is made to withdraw the plunger.

4,233,976
STYPTIC DEVICE

Wayne K. Dunshee, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 747,083, Dec. 3, 1976, abandoned. This application Jul. 6, 1978, Ser. No. 922,488
Int. Cl.³ A61M 7/00
U.S. Cl. 128—260 **7 Claims**

1. A styptic device capable of causing bleeding to stop in a minor wound when said device is applied to the wound without causing a significant pain sensation in the injured person and without significantly attaching to any clot formed in stopping said bleeding comprising:

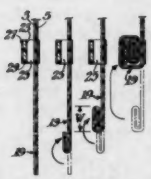
(a) a porous web comprising hydrophobic fibers, said web being at least about 50 microns in thickness, and

(b) about 0.05 to 0.90 gram of styptic material per cubic centimeter of web contained within said web, said styptic material being releasably attached in crystalline form to said hydrophobic fibers whereby said bleeding forms a liquid medium allowing said styptic material to diffuse back to the wound site to cause a vascular styptic effect.

4,233,977
CLOSURE MEANS FOR COLLECTION APPLIANCES

Larry J. Mattson, Largo, Fla., assignor to Howmedica, Inc., New York, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,275
Int. Cl.³ A61F 5/44
U.S. Cl. 128—283 **10 Claims**



1. In an ostomy collection appliance of the type having at least front and back opposed flexible flat walls, said walls defining a fecal receiving chamber between them and terminating at a drainage opening at the bottom of said appliance, and means for releasably closing said opening, the improvement wherein

said drainage opening closure means consists essentially of a semi-rigid strip securely affixed transversely with respect

to the collection appliance, in spaced relation to said drainage opening and adjacent and parallel to one of said opposed flexible walls so as to leave a gap between said semi-rigid strip and said adjacent flexible walls, said gap being open at both the top and bottom thereof,

whereby said drainage opening may be releasably closed by folding the lower ends of said opposed walls upwardly upon themselves together, and tucking said folded ends downwardly into said gap for snug fit therein.

4,233,978

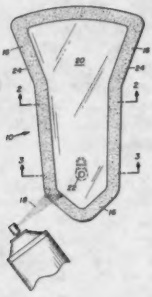
EXTERNAL FEMALE CATHETER

Glen A. Hickey, 706 Wesley, Glen Burnie, Md. 21061

Continuation-in-part of Ser. No. 787,549, Apr. 14, 1977, abandoned. This application Oct. 5, 1978, Ser. No. 948,822

Int. Cl.³ A61F *5/44*

U.S. Cl. 128—295 **5 Claims**



1. A female catheter (as recited in claim 4, wherein) for external application, comprising:

a receiving means, said receiving means being substantially flat and elongated in configuration, said receiving means receiving and containing a liquid, said receiving means being constructed from an extremely thin-walled stretchable and expandable material, said thin-walled stretchable and expandable material being capable of readily expanding to provide a greater volume and readily returnable to its original configuration, said receiving means having the edges thereof reinforced by a substantially flat planar thickening of the periphery of said stretchable and expandable material to form a reinforced edge;

an attaching means, said attaching means being applied to the surface on one side of said receiving means at the outer peripheral edges thereof for attaching said female catheter to a female patient; and

a drainage means, said drainage means being formed monolithically with said receiving means said drainage means and said receiving means of said female catheter being thereby of one-piece construction.

4,233,979

METHOD OF SCREWING AN ADAPTER INTO THE HUMAN CRANIUM

Georg Naser, Zirndorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,486

Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720455

Int. Cl.³ A61B *17/00*

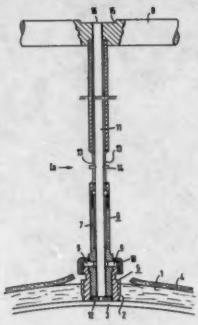
U.S. Cl. 128—303 R **1 Claim**

1. The method of inserting a hollow adapter into an opening in a human cranium, which comprises

(a) temporarily engaging the adapter with one axial end of a hollow tube (7) for joint rotation, and with an interior space of the hollow tube aligned with a hollow space of the adapter, and with a gauge element (11) extending through the aligned interior space and hollow space and terminating in a disk abutment member, so that the adapter and hollow tube can advance axially relative to the gauge element,

(b) positioning the gauge element axially in the tube such that the disk abutment member rests against the dura mater (3) at the opening in the human cranium,

(c) drivingly rotating the tube (7) to rotate the adapter and drive the same into the opening while the disk abutment member continues to rest on the dura mater (3),



(d) continuing the driving of the adapter into the opening until gauging indicia on the gauge element and on the hollow tube indicate that the adapter is flush with the engaging face of the disk abutment member which engages the dura mater, and

(e) thereafter disengaging the hollow tube from the adapter and removing the hollow tube and gauge element from the opening to expose the dura mater for application of a pressure converter to be inserted into the hollow space of the adapter.

4,233,980

HEMOSTATIC COMPRESSIVE DEVICE

Lorin P. McRae, and Mark M. Kartchner, both of Tucson, Ariz., assignors to Narco Scientific Industries, Inc., Fort Washington, Pa.

Continuation of Ser. No. 774,682, Mar. 7, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 967,992

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—325 **16 Claims**

1. Apparatus for applying pressure to areas comprising:

(a) bladder means including a first sheet of generally non-elastic flexible material and a second sheet of generally non-elastic flexible material, said first and second sheets being mutually connected about their respective peripheries, wherein said bladder means is inflatable to expand by the mutual separation of the interior regions of said two sheets generally along the direction in which pressure is to be applied to such area;

(b) pressure plate means for contacting one of said sheets for constraining said bladder means;

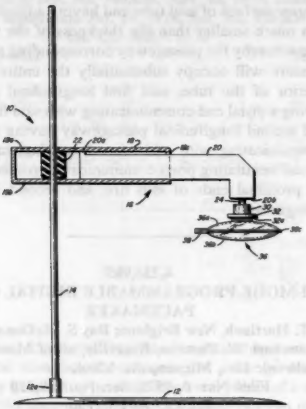
(c) support means for supporting said pressure plate means, including base means and positioning arm means for mounting thereon whereby said pressure plate means may be selectively positioned;

(d) housing means, as part of said positioning arm means, including generally opposed first and second elongate wall means, joined to said base means and selectively moveable, relative thereto, translationally and rotationally;

(e) sliding arm means, as part of said positioning arm means, telescopically moveable generally between and along said

first and second wall means whereby said positioning arm means is selectively extensible, and to which said pressure plate means may be selectively connected;

(f) first selectively releasable lock means, including sleeve means positioned between said first and second wall means and frictionally engaging said base means, for selectively maintaining said housing means fixed against motion relative to said base means; and



(g) second selectively releasable lock means, including frictional engagement between at least one of said first and second wall means and said sliding arm means, for selectively maintaining said sliding arm means fixed against motion relative to said housing means.

4,233,981

DEVICE FOR CLOSING SEVERED BODY VESSELS

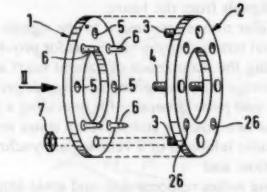
Paul H. Schomacher, Braunsbergstrasse 13, 4400 Münster, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,565

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657255

Int. Cl.³ A61B *17/04*

U.S. Cl. 128—334 R **2 Claims**



1. A surgical device for closing severed body vessel walls comprising:

a pair of annular flanges each formed of a material compatible to a human body,

said flanges being positionable to having their planar faces in opposed relationship with vessel walls disposed between said flanges,

pointed pins anchored to one of said flanges and extending through openings in the other flange and piercing the vessel walls between said flanges and retaining their pointed ends,

threaded holding pins mounted on one of said flanges and having threaded portions extending through aligned apertures in the other of said flanges,

and threaded fasteners for threading onto said threaded holding pins to hold said flanges and said pointed pins against separation, said threaded fasteners being turned in one direction on said threaded holding pins to various locations depending on the thickness of the vessel walls, said threaded fasteners being turnable in a direction opposite to said one direction to reduce the clamping pressure on the vessel walls to prevent a necrotic condition.

4,233,982

TROCAR SLEEVES HAVING A BALL VALVE

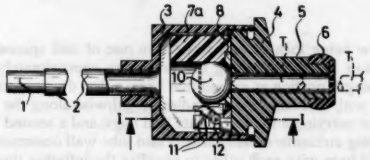
Siegfried Bauer, Heidelsheim, and Manfred Boebel, Oetisheim, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,561

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1977, 7735963

Int. Cl.³ A61B *17/34*; F16K *51/00*

U.S. Cl. 128—347 **2 Claims**



1. In a trocar sleeve of the kind having a widened part forming a housing between the distal portion of said sleeve and its proximal portion, which latter extends from a plug for said widened housing part, and a ball valve in said widened housing part which ball valve is closable by resilient means and which is openable by a trocar passing through an opening in said plug and said sleeve, the improvement which consists in that said widened part forming the housing receives an insert said insert extending around said ball valve in a generally U-shaped configuration and thus affording a ball-receiving space, said insert is secured to said plug with a peripheral portion of the insert in clamping engagement with an inserted sealing gasket of deformation-resistant plastics material which is apertured to form a valve seating between the plug and insert, and in that the space presented by said insert forms a space for the ball of and thereby allow passage in said trocar sleeve of a trocar therethrough said ball valve to swing into and out of, said ball being biased by a tangentially loaded spring to seat in the aperture of said gasket, said spring being placed under stress by being connected to said insert, and said insert being separably attached to said plug, whereby said spring acts to automatically seat said ball valve against said gasket when said trocar is removed from said trocar sleeve and thereby prevent backflow of fluids through said trocar sleeve.

4,233,983

CATHETER PROVIDED WITH A SAFETY-FIXING MEMBER, REMOTELY ADJUSTABLE AND EXPANDIBLE BY INTRODUCING FLUIDS

Francesco Rocco, Via Fogazzaro, 20, 20100 Milano, Italy

Filed May 22, 1978, Ser. No. 908,382

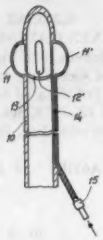
Claims priority, application Italy, May 30, 1977, 21426 A/77; Oct. 26, 1977, 22581 A/77

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—349 B **5 Claims**

1. A catheter apparatus which comprises a tuve having a closed forward end portion disposed for insertion into a body cavity to drain fluid therefrom, the wall of said tube circumferentially extending to define a lumen for passage of said fluid; a pair of resilient inflatable bags connected to the wall of said tube at the forward end portion thereof, said bags extending

circumferentially about said tube in diametrically opposed relation to each other and extending lengthwise along the tube over approximately the same length portion of the tube, said bags being limited in circumferential extension to define on the tube wall a pair of spaces each between said bags and disposed in diametrically opposed relation to each other; means defining a pair of opposed oblong open windows in said tube wall, each



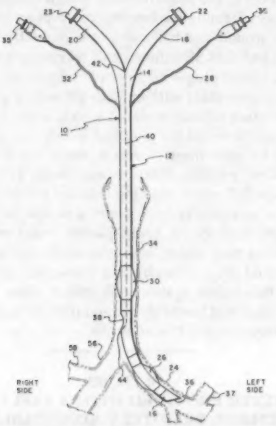
window being located in a respective one of said spaces and extending lengthwise along the tube over approximately the same length portion as extend said bags; a first duct communicating with said bags and extending lengthwise along the tube wall for carrying a fluid to inflate said bags, and a second duct extending circumferentially within said tube wall communicating said bags with each other to equalize the inflation thereof.

4,233,984

RESPIRATORY VENTILATING DEVICE

Peter T. Walling, 14126 Brookridge Cir., Dallas, Tex. 75240

Filed Jun. 30, 1978, Ser. No. 920,723
Int. Cl.[3] A61M *25/00*
U.S. Cl. 128—207.14 **3 Claims**



1. A respiratory ventilating device for conducting gaseous materials under slight gaseous pressure differential to and from the lungs of a patient separately or simultaneously, comprising:

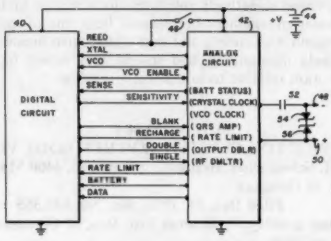
an elongated flexible tube adapted to extend through the patient's trachea to a point within the bronchus of one lung, said tube having walls forming a generally cylindrical interior surface, first means disposed about said tube for forming a gaseous seal in said bronchus, second means disposed about said tube for forming a gaseous seal in the trachea, said tube having a first opening distal to both said seal means and a second opening between said first seal means and second seal means, a thin flexible membrane dividing the interior of said tube into first and second isolated longitudinal passageways, said membrane being sufficiently flexible to respond to differences in pressures of the gasses conducted by said longitudinal passageways by moving toward the passageway corresponding to the lower gaseous pressure, said membrane having a lax transverse dimension approximately equal to one half of the interior surface of said tube and having a thickness dimension much smaller than the thickness of the walls of the tube whereby the passageway corresponding to the higher pressure will occupy substantially the entire cylindrical interior of the tube, said first longitudinal passageway having a distal end communicating with said first opening, said second longitudinal passageway having a distal end communicating with said second opening, said first and second ventilating ports communicating respectively with the proximal ends of said first and second longitudinal passageways.

4,233,985

MULTI-MODE PROGRAMMABLE DIGITAL CARDIAC PACEMAKER

Jerome T. Hartlaub, New Brighton; Ray S. McDonald, St. Paul, and Lawrence W. Shearon, Roseville, all of Minn., assignors to Medtronic Inc., Minneapolis, Minn.

Filed Nov. 6, 1978, Ser. No. 958,320
Int. Cl.[3] A61N *1/30*
U.S. Cl. 128—419 PG **19 Claims**



1. A progammable cardiac pacemaker pulse generator comprising:

a pair of output terminals adapted to provide signals to and receive signals from the heart;

sense amplifier means responsive to the signals received by said output terminals from said heart for providing a signal manifesting the occurrence of natural heart activity;

program storage means responsive to signals provided external from said pulse generator for providing a signal in one of at least two possible states, which states indicate either a ventricular inhibited or a ventricular synchronous mode of operation; and

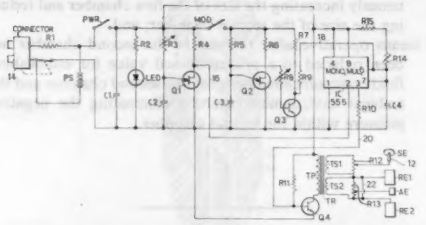
digital timing means responsive to said sense amplifier means signal and said program storage means signal for providing cardiac stimulating signals to said output terminals in accordance with the desired mode of operation, including triggerable oscillator means and gate means, said triggerable oscillator means providing a signal whenever a certain time has passed since the last signal provided thereby or whenever a trigger signal is applied thereto, and said gate means responding to said program storage means signal being in the one state indicating a ventricular synchronous mode of operation by providing said trigger signal to said triggerable oscillator means in response to each sense amplifier means signal, said gate means further responding to said program storage means signal being in the other state indicating a ventricular inhibited mode of operation by blocking the passage of any signals therethrough.

4,233,986

APPARATUS AND METHOD FOR CONTROLLING PAIN BY TRANSCUTANEOUS ELECTRICAL STIMULATION (TES)

Joseph Tannenbaum, Jerusalem, Israel, assignor to Agar Ginosar Electronics and Metal Products, Doar Na Emek, Israel

Continuation of Ser. No. 740,499, Nov. 10, 1976, abandoned.
This application Jul. 18, 1978, Ser. No. 925,839
Int. Cl.[3] A61N *1/36*
U.S. Cl. 128—421 10 Claims



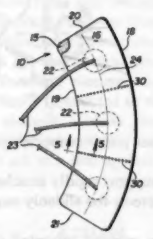
1. Apparatus for controlling pain in a patient by transcutaneous electrical stimulation comprising: a pulse generator for continuously generating periodic electrical pulses of a width of from 68 to 740 microseconds, and a voltage of from 60 to 150 volts; external electrode means including at least a pair of skin electrodes coupled to said pulse generator and adapted to be placed in contact with the skin of the patient for applying said pulses thereto; and a pulse-width modulator for modulating the width of the pulses generated by said generator and applied by said electrodes to the patient's skin.

4,233,987

CURVILINEAR ELECTROCARDIOGRAPH ELECTRODE STRIP

Alfred Feingold, 5310 Maggiore St., Coral Gables, Fla. 33146

Filed Aug. 18, 1978, Ser. No. 934,854
Int. Cl.[3] A61B *5/04*
U.S. Cl. 128—639 5 Claims



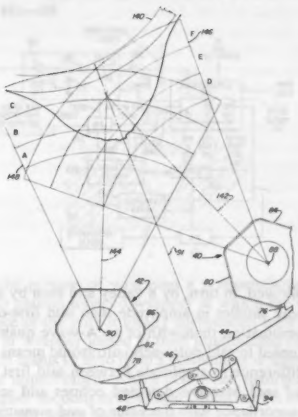
1. An electrode pad comprising a thin, flexible, narrow, generally flat, and elongate strip having two opposite faces bounded by common edges including two curvilinear edges opposite one another and extending the elongate length of the strip, the pad being adapted to be applied to the chest or thorax of a patient as for electrodcardiography, wherein the strip carries a plurality of electrodes spaced apart along such strip on one face thereof, whereby the strip may readily and without stretching assume the curved contour of a patient's body upon application of said strip thereto.

4,233,988

HIGH RESOLUTION ROTATING HEAD ULTRASONIC SCANNER

Donald E. Dick, Boulder; Robert L. Metz, Superior; D. Scott RoJohn, Boulder, and Raymond D. Elliott, Denver, all of Colo., assignors to Life Instruments Corporation, Boulder, Colo.

Filed Jul. 5, 1978, Ser. No. 922,185
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—660 26 Claims



1. An ultrasonic scanner comprising:
a body portion;
a scanning head having an axis of rotation;
means for mounting the scanning head on the body portion for rotation about its axis of rotation;
means mounted on said body portion for rotating the scanning head about its axis of rotation;
a plurality of wide apertured focused ultrasonic transducers, each transducer being individually distinct from said other transducers, each transducer having a predetermined focal range different than the predetermined focal ranges of each of said other transducers, said focal ranges being contiguous, each of said transducers when energized producing a beam of acoustic energy having a beam axis, each of the beams of acoustic energy being produced only by one of said distinct energized transducers;
means for mounting the transducers on the scanning head so that the beam axes of said transducers are substantially perpendicular to the axis of rotation of the scanning head, said beam axes substantially lying in the same plane, and the angles between the beam axes being substantially equal; and
means for connecting the transducers to a transmitter/-receiver and for energizing the transducers so that the transducers scan a given sector, said sector being divided into contiguous zones with the depth of each zone of the given sector corresponding to the focal range of one of the transducers.

4,233,989

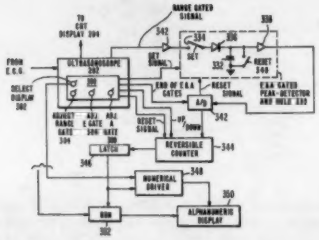
ECHOCARDIOGRAPHIC APPARATUS FOR MYOCARDIAL DISEASE DIAGNOSIS BY A-WAVE QUANTIFICATION

Simon Larach, and David H. R. Vilkomerson, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,456
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—661 6 Claims

1. An echocardiographic diagnostic apparatus comprising

pulse-echo ultrasonic means for insonifying the heart of a subject with successive pulses of ultrasonic wave energy synchronized with the heartbeat of said subject and then detecting echoes of said insonified heart of said subject, said detected echoes including those which when displayed on a cathode-ray-tube display appear as an M-wave, said M-wave having a waveform shape specifically determined by both the movement of said subject's heart as a whole and by the movement of the mitral valve within said subject's heart, said specifically-determined waveform of said M-wave including a first-occurring peak followed, in turn, by a valley and then by a second-occurring peak smaller in amplitude than said first-occurring peak; the combination therewith of an A-wave quantification indicator coupled to said pulse-echo ultrasonic means for measuring the difference in amplitude between said first and second peaks of said M-wave detected echoes and selectively deriving, in accordance with the value of said measured difference, an indication in a form that distinguishes subjects suffering from one of myocardial disease and hyperkinetic syndrome from normal subjects.

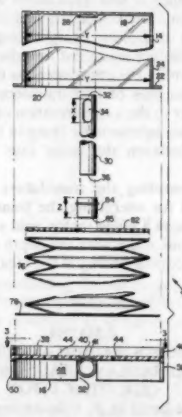


4,233,990

VOLUME AND FLOW-RATE DEPENDENT INSPIRATOR

Lloyd M. Yardley, Decatur, Ga., assignor to Empire Plastics Manufacturing Inc., Decatur, Ga.

Filed Mar. 20, 1979, Ser. No. 22,330
Int. Cl.[3] A61M *16/00*; A63B *23/00*
U.S. Cl. 128—728 **15 Claims**



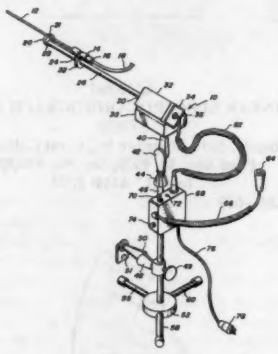
1. A device for measuring inspiratory capacity comprising:
a housing;
dividing means positioned inside said housing for dividing the interior of said housing into a first chamber and a second chamber, at least a portion of the second chamber being positioned above the first chamber;
first means for establishing fluid communication between the first chamber and the ambient environment;
second means for establishing fluid communication between the second chamber and a user of the device so that inhalation by the user through the second means creates a negative pressure within the second chamber;
said dividing means including means responsive to the negative pressure within the second chamber for simultaneously increasing the size of the first chamber and reducing the size of the second chamber; and
means operative after the size of the second chamber has been reduced to a predetermined value for establishing fluid communication between the second chamber and the ambient environment, thereby eliminating the negative pressure within the second chamber.

4,233,991

URETHRAL CATHETER PULLER

William E. Bradley; William M. Klatt, both of Minneapolis; Charles C. Kuyava, Brooklyn Center, and Robert D. Dreher, Roseville, all of Minn., assignors to American Medical Systems, Inc., St. Louis Park, Minn.

Continuation-in-part of Ser. No. 696,318, Jun. 15, 1976, Pat. No. 4,199,916. This application Dec. 18, 1978, Ser. No. 970,465
Int. Cl.[3] A61B *5/10*
U.S. Cl. 128—733 **8 Claims**

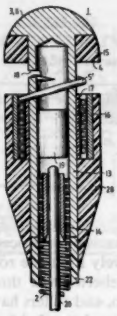


1. A urethral catheter puller comprising:
a boom;
a forward catheter support rigidly attached to said boom and having means thereon for slidably supporting a urethral catheter;
a rearward catheter support mounted on said boom rearwardly of said forward catheter support with respect to the point of exit of a uretheral catheter from a patient's body and having means thereon for firm attachment to a urethral catheter;
drive means for moving said rearward catheter support along the length of said boom at a controlled rate; and
positioning means to allow said boom to assume a plurality of angular orientations and to allow said forward catheter support to be placed in close proximity to the point of exit of a urethral catheter from a body, wherein said boom is mounted on said positioning means.

4,233,992
IMPLANTABLE ELECTRODE

Hans-Jürgen Bisping, Tittardshang 12, D-5100 Aachen-Laurensberg, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,097
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732547; Jul. 19, 1977, 225913[U]
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—785 **22 Claims**



1. In a body implantable electrode including an electrode head having a stimulation surface at its end, an insulated electrode lead and at least one fastening element for fixing the electrode so as to bring the stimulation surface into contact with body tissue, the improvement wherein: said fastening element is disposed at a location spaced behind said end of said electrode head in the axial direction of said electrode lead; said fastening element is arranged to be in a retracted position, during insertion of said electrode, substantially within the outer contour of said electrode head which is touched by body tissue during insertion, and said fastening element is arranged to be moved essentially in the radial direction, normal to the axial direction of said electrode lead, beyond the outer contour of said electrode head, into an extended position in which it extends laterally beyond such outer contour at a location behind said end of said electrode head, with respect to the direction of insertion of said electrode, so as to penetrate in the body tissue surface and fix said electrode in place; said electrode further comprises fastening element control means guided within said electrode lead and controllable from the end of said electrode lead remote from said electrode head for effecting movement of said fastening element from its retracted position to its extended position, and an intermediate element separate from, and acted on by, said control means for effecting such movement of said fastening element; said electrode head comprises a hollow cylinder connected to said electrode lead; and said intermediate element extends along the inside of said cylinder and movingly and sealingly engages the interior wall of said cylinder to act as a seal against the intrusion of body fluids.

4,233,993
SMOKING MATERIAL

Ralph R. Miano, and Charles H. Keith, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

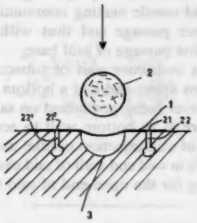
Continuation of Ser. No. 607,301, Aug. 25, 1975, abandoned, which is a continuation of Ser. No. 400,465, Sep. 24, 1973, abandoned, which is a continuation of Ser. No. 216,763, Jan. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 841,969, Jul. 15, 1969, abandoned. This application Mar. 17, 1978, Ser. No. 887,572
Int. Cl.³ A24B *5/16*; A24D *1/18*
U.S. Cl. 131—2 **10 Claims**

2. The process of claim 1 wherein said combustible material is selected from the group consisting of carboxymethyl cellulose and carboxymethyl cellulose salts.

4,233,994
WRAPPING PROCESS FOR CIGARS WITH NATURAL TOBACCO

Bernard J. Sass, Morlaix, France, assignor to Service d'Exploitation Industrielle des Tabacs, France

Filed Feb. 3, 1978, Ser. No. 874,889
Claims priority, application France, Feb. 9, 1977, 77 03559
Int. Cl.³ A24C *1/26, 1/28, 1/30*
U.S. Cl. 131—58 **8 Claims**

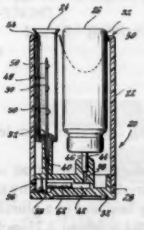


1. In the process of wrapping a premanufactured tobacco core with natural tobacco wrapper in which the circumferential surface of the core is totally surrounded with one or more sections of wrapper joined at their longitudinal edges in a like number of seams so as to form a continuous wrapper about said core, the improvement which comprises maintaining each of said wrapper sections in stretched condition between its longitudinal edges while said core is being surrounded and said seams are being formed.

4,233,995
CIGARETTE/CIGAR TREATMENT DEVICE

Paul M. Kotuby, Naugatuck, and Joseph F. Reed, Bridgewater, both of Conn., assignors to Risdon Corporation, Naugatuck, Conn.

Filed Apr. 12, 1979, Ser. No. 29,191
Int. Cl.³ A24F *47/00*
U.S. Cl. 131—133 R **3 Claims**



1. A device for treating a consumer unit of tobacco, comprising

a generally cylindrical casing open at its lower end and having an end wall partially closing its upper end, said casing having a size and shape adequate to receive in side-by-side relation a valved tubular aerosol dispenser and a tubular receiver for a consumer unit of tobacco;

a molded plastic base received in the open end of said casing and providing a closure for the lower end of said casing;

said base having a pair of parallel passages directed axially of said casing and being in spaced relation to each other, and a transverse passage intersecting said spaced parallel passages and providing communication between them within said base;

said transverse passage being closed at one end and having a restricter plug removably received in the other end said

plug extending axially into said transverse passage to partially restrict communication between said parallel passages;

a first of said parallel passages terminating at its upper end in an upwardly opening socket and being adapted and arranged for coupling thereto in fluid tight manner of a valve stem of a conventional axially operable valve of an aerosol dispenser, and said casing having a receiving aperture at its closed end in axial alignment with said socket for insertion of an aerosol dispenser into coupling engagement with said socket;

said other of said parallel passages having mounted therein a hollow injection needled projecting axially outwardly therefrom, said needle making communication internally with said other passage and thus with said transverse passage and first passage of said base;

a receiver for a consumer unit of tobacco, said receiver having an open upper end and a bottom wall at its other end, said receiver being positioned on said base and having an aperture in its bottom wall to accept the passage therethrough of said injection needle; and

a second aperture in said end wall of said casing providing an access opening for the open end of said tubular receiver.

4,233,996

CUTTING LEAF TOBACCO

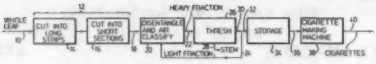
Warren A. Brackmann, Cooksville, and Daniel DiIanni, Toronto, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed May 21, 1979, Ser. No. 40,487

Claims priority, application United Kingdom, May 23, 1978, 21640/78

Int. Cl.³ A24B *5/00*

U.S. Cl. 131—140 R **8 Claims**



1. A method of forming cigarettes from leaf tobacco, which comprises:

cutting at least a substantial proportion of the tobacco leaf into a plurality of shreds of tobacco by substantially simultaneously subjecting said leaf to a plurality of longitudinal cuts of width about 0.5 to about 0.75 inches to establish the length of said shreds and to a plurality of transverse cuts of width about 0.02 to about 0.05 inches to establish the width of said shreds,

separating said plurality of shreds into a heavier fraction of shreds containing substantially all of said plurality of shreds having leaf stem associated with lamina in an amount which is no more than 20% of said shreds and a lighter fraction of shreds containing substantially all of said plurality of shreds consisting of lamina not having leaf stem associated therewith,

threshing said heavier fraction to separate said leaf stem from the lamina portions associated therewith,

recovering said lamina portions and mixing the same with said lighter fraction to form a cigarette rod-forming operation feed, and

forming cigarettes directly from said feed.

4,233,997

RIB ROLLER FOR PROCESSING TOBACCO RIBS

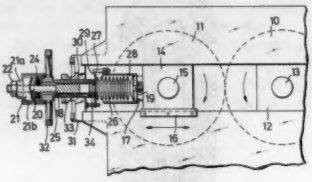
Karl W. Quester; Josef Gontgen, and Adolf Muller, all of Cologne, Fed. Rep. of Germany, assignors to Firm Wilh. Quester, Cologne, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,230

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623825

Int. Cl.³ A24M *5/14*

U.S. Cl. 131—147 R **25 Claims**



1. A rib-rolling mechanism for processing tobacco ribs comprising a pair of relatively rotatable rollers having peripheral surfaces defining therebetween a throat through which is adapted to pass tobacco, said rollers having shafts, the shaft of a first of said rollers being journaled for rotation in fixed bearings, the shaft of a second of said rollers being journaled for rotation in movable bearings, means for resiliently urging said second roller toward said first roller, said urging means including a rod connected to each of said movable bearings, a sleeve in external telescopic relationship of each of said rods, spring biasing means coupled between each of said sleeves and said second roller for urging the latter toward said first roller, means for axially shifting said rods to vary the force exerted by said springs in a direction to urge said second roller toward said first roller, means for bodily moving as a unit said second roller, spring biasing means, rods and sleeves; and said bodily moving means including means for effecting rotation of said sleeves without affecting the force of said springs as established by said axially shifting means.

4,233,998

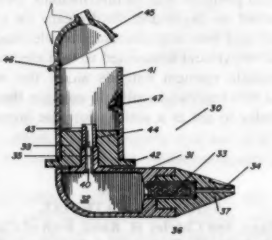
SMOKING APPARATUS

Ross T. Radey, Jr., 947 Clopper Rd., Apt. B-3, Gaithersburg, Md. 20760

Filed Jun. 23, 1978, Ser. No. 918,677

Int. Cl.³ A24F *13/16, 13/12*

U.S. Cl. 131—175 **5 Claims**



1. A smoking apparatus comprising in combination:

a chamber and filter casing having a passageway therethrough connecting a chamber therein and a filter holding compartment adjacent to said chamber;

a mouthpiece removably mounted to said chamber and filter casing;

cigarette holding means attached to said chamber and filter casing for mounting a cigarette therein;

a cylindrical sleeve removably mounted to said cigarette holding means for encircling a cigarette mounted in said cigarette holding means to confine said cigarette from wind, and to collect ashes and the like therein;

a hinged lid attached to said cylindrical sleeve by a hinge; and

a whistle slot formed in the side of said cylindrical sleeve whereby drawing upon said smoking apparatus will generate a whistling sound when said hinged lid is closed.

4,233,999

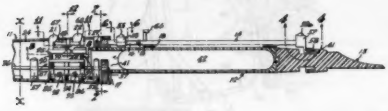
AUTOMATIC CURLING IRON

Louis N. Thomas, 990 NE. 156 Terrace, North Miami Beach, Fla. 33162

Filed Sep. 5, 1978, Ser. No. 939,468

Int. Cl.³ A45D *2/12*

U.S. Cl. 132—34 R **10 Claims**



1. An automatic hair curling iron comprising, in combination, a handle member, an elongated tubular heating member fixed with respect to and extending outwardly at one end of said handle member, an electrical heating element within said heating member, an elongated pressing bar, mechanism supporting said elongated pressing bar in spaced relation along the outside of said tubular heating member, said pressing bar supporting mechanism comprising means pivotally supporting the inner end of pressing bar to permit its upward swinging movement for the insertion of strands of hair to be pressed between said pressing bar and said tubular heating member, an electric drive motor, and mechanism interconnecting said electric drive motor with the inner of said pivotally supporting means for automatic rotation of said pressing bar circularly about both said heating member and said handle member upon energization of said electric drive motor.

4,234,000

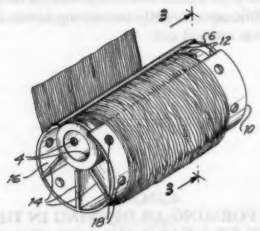
COMPOUND HAIR ROLLER

Carmine P. Pizzino, 251 Westminister Rd., Brooklyn, N.Y. 11218

Filed Nov. 29, 1978, Ser. No. 964,738

Int. Cl.³ A45D *2/02*

U.S. Cl. 132—39 **6 Claims**



1. Apparatus for curling a length of hair comprising

A first member of hollow cylindrical configuration adapted to receive a length of hair wound about its circumference and

a second member including a substantially cylindrical shell having a longitudinal slot in its wall defining confronting edges thereof and a plurality of peripherally spaced projections extending longitudinally along and projecting inwardly from the inner surface of said wall and terminating in free edges coinciding with a cylindrical surface, said wall being adapted to admit said first member at least partially through said slot and into engagement with said projections.

4,234,001

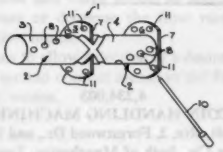
HAIR TREATMENT DEVICE

Joe Morefield, 400 Reynolds St., Springhill, La. 71075

Filed Jul. 23, 1979, Ser. No. 59,517

Int. Cl.³ A45D *2/00*

U.S. Cl. 132—40 **10 Claims**



1. A hair treatment device comprising a rod of selected length; at least one partition positioned intermediate the ends of said rod and projecting from said rod in essentially perpendicular relationship and having a first truncated segment intersecting a surface of said rod; a pair of grooves provided in said rod and extending in an arc from opposite sides of said rod on one side of said partition to opposite sides of said rod on the other side of said partition and intersecting at said first truncated segment; and a plurality of apertures in said rod and said partition for receiving pins to secure a curl or tress of hair in place.

4,234,002

ADJUSTING MEANS FOR MONEY HANDLING MACHINES

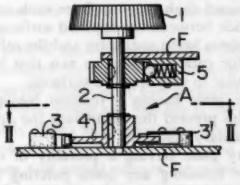
Isamu Uchida, and Kenkichi Watanabe, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,463

Claims priority, application Japan, Dec. 16, 1976, 51-168475; Dec. 27, 1976, 51-176247

Int. Cl.³ B65B *59/00*

U.S. Cl. 133—1 A **2 Claims**



1. Money handling machine including adjusting means for accommodating the machine to a desired type of money, said adjusting means comprising a manually operated section which includes three first switches, at least one manually operated switch actuating member having six money selecting positions and means for actuating predetermined ones of the first switches in accordance with the position of said actuating member, an operating section including at least one adjusting member which is movable to a plurality of positions, means for actuating the adjustable member for accommodating the machine to a desired type of money, second switches corresponding in number to the first switches and being so connected that

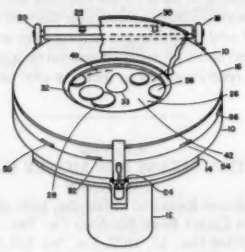
the second switches co-operate with respective ones of the first switches, means for actuating predetermined ones of the second switches in accordance with the position of the adjustable member whereby a change in electrical condition is produced when the second switches take predetermined positions with respect to the first switches, said predetermined positions of the second switches being opposite to the positions taken by the respectively corresponding first switches so that lines through the first and second switches are opened when the adjustable member is moved to a position corresponding to the position of the switch actuating member.

4,234,003

COIN HANDLING MACHINE

Victor G. Ristvedt, Rte. 2, Forestwood Dr., and Roy B. Johnson, Rte. 6, Belmar Cir., both of Manchester, Tenn. 37355

Continuation of Ser. No. 735,060, Oct. 22, 1976, Pat. No. 4,098,280. This application Jun. 30, 1978, Ser. No. 921,063
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.³ G07D *3/00*
U.S. Cl. 133—3 A **5 Claims**



2. A coin sorting apparatus comprising:

a pair of substantially parallel horizontal plates forming a pair of opposed surfaces which have at least portions thereof spaced slightly away from each other to permit coins to slide between the opposed surfaces;

one of said plates being stationary and the other plate being mounted for rotation about an axis that is substantially perpendicular to said opposed surfaces;

the rotatable plate having a resilient biasing surface for urging coins pressed therein toward the opposed surface of the stationary plate; and

the stationary plate having a plurality of recessed areas therein for releasing any coins entering such recessed areas from the biasing pressure of said resilient surface and thereby permitting radial movement of coins between the two plates by rotation of the rotatable plate, said recessed areas being shaped to (1) guide coins in single file along an arcuate path between the plates, and (2) permit coins of different sizes to escape radially from between said plates at different predetermined positions around the periphery of the stationary plate.

4,234,004

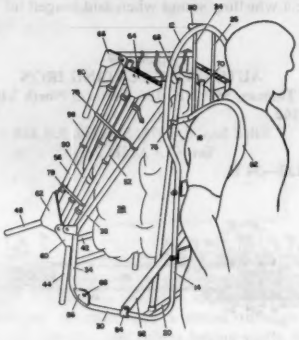
Patent Not Issued For This Number

4,234,005

COMBINATION PACK FRAME, COT, AND TENT

Edward L. Taylor, III, 6345 Kester Ave., Van Nuys, Calif. 90411

Filed Dec. 6, 1978, Ser. No. 966,890
Int. Cl.³ A45F *3/10, 4/02*
U.S. Cl. 135—1 R **9 Claims**



1. A lightweight combination pack frame, cot, and tent comprising:

a tubular A-frame having an open central area having a size approximating a person's back, said A-frame including a lower portion for engaging the ground, and an upper portion for supporting a tent;

a cloth pack for containing conventional back packing equipment, and including means for engaging said tubular A-frame to support said pack in said open central area;

shoulder strap means for supporting said pack and A-frame on the wearer's back;

frame means extending to the rear substantially perpendicular to said A-frame and firmly secured to said A-frame for supporting said A-frame in the upright orientation when it is placed on the ground, and for enclosing said pack;

additional tubular frame means foldably secured to said rearwardly extending frame means for forming a cot when unfolded and for assembly into firm juxtaposition with said A-frame and said rearwardly extending frame means, when folded forward; and

said cot having a much lower elevation than the height of said A-frame, whereby the A-frame provides a tent support to give protection from the elements to a person on said cot, while concurrently permitting access to said pack to the person on said cot.

4,234,006

METHOD OF FORMING AN OPENING IN THE OUTER ENCLOSURE OF A GAS-INSULATED ELECTRICAL APPARATUS

Alan H. Cookson, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

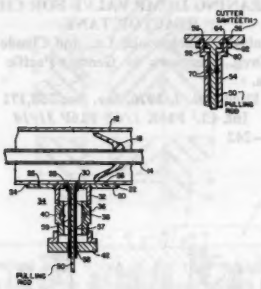
Filed Jan. 11, 1979, Ser. No. 2,631
Int. Cl.³ B23B *41/08;* **F16L** *41/04;* **H01B** *9/06*
U.S. Cl. 137—15 **2 Claims**

1. A method for forming an opening in a gas-containing metal enclosure which minimizes the escape of gas comprising the steps of:

fixedly securing a pulling rod to the enclosure at the location of the desired opening;

fixedly securing a support plate having an opening therethrough to said enclosure such that said pulling rod extends through said support plate opening;

securing a movable valve means-containing housing to said support plate adjacent said support plate opening, said movable valve means having an opening therethrough and capable of being in a first position preventing a flow of gas past said valve means and said housing and a second position with said valve means opening being aligned with said support plate opening, said valve means being in said second position with said pulling rod extending through said valve means opening;



securing an end plate having an opening therethrough aligned with said valve means opening when said valve means is in said second position to said housing, said pulling rod extending through said end plate opening;

inserting an elongated hollow tube having sawteeth at one end thereof through said end plate opening, said valve means opening, and said support plate opening to contact said sawteeth against said metal enclosure, said pulling rod being disposed within said tube;

rotating said tube such that said sawteeth cut into said enclosure;

pulling said pulling rod and said tube to remove the metal material cut out from said enclosure;

withdrawing said pulling rod and said tube from said support plate opening and said valve means opening; and

rotating said valve means to said first position.

4,234,007

AUTOMATIC LIQUID FLOW CONTROL DEVICE

Joseph R. Titone; David C. Brissey, and Denny L. Carlson, all of Iowa City, Iowa, assignors to Scientific Applications Incorporated, Mount Pleasant, Iowa

Filed Aug. 14, 1978, Ser. No. 933,625

Int. Cl.[3] G05D *11/13*; F04B *39/00*

U.S. Cl. 137—101.19 **5 Claims**

1. An automatic liquid flow control device, comprising,

first metering means for measuring the rate of flow of liquid through a first conduit means,

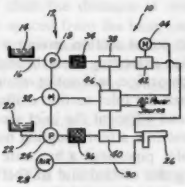
second metering means for measuring the rate of flow of liquid through a second conduit means,

valve means connected to said second conduit means to control the rate of flow of liquid through said second conduit means, and

selectable valve control means operationally connected to said valve means and said first metering means to automatically maintain the rate of flow of liquid through said second conduit means to substantially maintain a preselected ratio of flow rate through said second conduit means to flow rate through said first conduit means,

said valve control means comprising a motor means connected to said valve means to progressively alternately open and close said valve means to selectively progressively increase or decrease the flow rate through said second conduit means,

a selector means to allow selection of a desired ratio to flow rate in said second conduit means to the flow rate in said first conduit means,



a first comparator means electrically connected to said first and second metering means and said selector means to compare the actual ratio of flow rate in said first and second conduit means to the selected ratio of said selector means, and

a motor control means to activate said motor means so that said valve means adjusts the flow rate in said second conduit means whereby said actual ratio of flow rate substantially approaches said selected ratio of flow rate of said selector means, said motor control means being electrically connected to said motor means and said comparator means,

said motor control means comprising a direction control means to control the direction of rotation of said motor means whereby rotation in one direction progressively opens said valve means and rotation in the other direction progressively closes said valve means, and

speed control means to increase the speed of said motor means when said actual ratio of flow rate deviates from said selected ratio by a first predetermined percentage,

said direction control means and said speed control means being electrically interconnected and electrically connected to said motor means and said comparator means.

4,234,008

FLUID CHOKE

Ramsey L. Cronfel, 725 Parkview Cir., Elk Grove Village, Ill. 60007

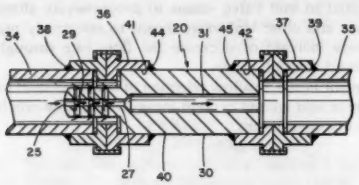
Filed Aug. 24, 1978, Ser. No. 936,330

Int. Cl.[2] F16T *1/00*

U.S. Cl. 137—182 **8 Claims**

1. A fluid choke assembly for controlling pressurized fluid

flow comprising: an inlet pipe and an outlet pipe, a one-piece choke member having an elongated inlet section having an outer diameter significantly less than the inner diameter of the inlet pipe, an axial orifice extending through the inlet section having a substantially constant diameter, means for reducing the collection of foreign material in the inlet section orifice including a plurality of generally radial openings extending from the orifice to the outer diameter of the inlet section, said choke member having an outlet section communicating with



the outlet pipe, said outlet section having a substantially constant diameter orifice extending therethrough communicating with the inlet section orifice, said outlet section orifice being of greater diameter than the inlet section orifice, said outlet section having a first end adjacent the inlet section and a second end opposite the first end, a first coupling member connecting first end to the inlet pipe, and a separate second coupling member connecting the second end of the outlet section defines the outer diameter of part of the assembly.

4,234,009

STRAIGHT FLOW SEAT VALVE

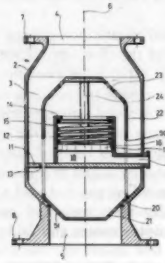
Franz Fuchs, Starnberg, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Sep. 22, 1978, Ser. No. 944,913

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 27449178

Int. Cl.³ F16K *1/12, 31/122*

U.S. Cl. 137—219 **6 Claims**



1. A straight flow seat valve comprising a valve housing having a chamber extending therethrough between a fluid inlet at one end of said housing and a fluid outlet arranged coaxial with said inlet at the other end of said housing, a control cylinder fixedly supported in said chamber between said outlet and said inlet, a control piston movably disposed in said cylinder, a seating surface defined in said housing adjacent said outlet, a seat body movably mounted in said chamber adapted to matingly seat against said seating surface to close said outlet and being movable away from said seating surface to open said outlet, said seat body having a connecting part extending from one side of said cylinder adjacent said outlet to the opposite side of said cylinder adjacent said inlet, said connecting part being spaced inwardly of said housing, a piston rod carried by said piston rigidly connected to said seat body, spring means engaged with said piston for biasing said seat body against said seating surface, means extending out of said housing for admitting fluid into said cylinder to move said control piston against said spring to move said seat body off of said seating surface, and means supporting said cylinder in said chamber intermediate the length of said housing having an opening therethrough, said seat body including an intermediate tubular portion having a wall extending through said opening.

4,234,010

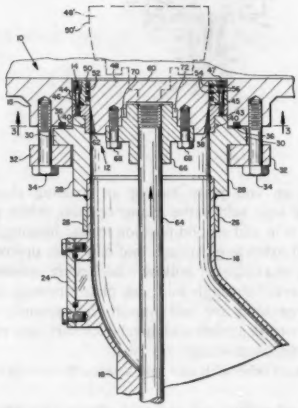
SELF-CLEANING DUMP VALVE FOR CHEMICAL REACTOR TANK

Robert E. Jenkins, Ponchatoula, La., and Claude Acree, Lake Oswego, Oreg., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Oct. 7, 1976, Ser. No. 730,171

Int. Cl.³ F16K *1/42;* F16F *31/14*

U.S. Cl. 137—242 **12 Claims**



1. A dump valve apparatus for removing liquid from a container tank, in which the improvement comprises:

a dump valve having a valve inlet opening and a valve outlet opening;

a valve seat having a discharge passage through which said liquid is drained from said tank, said discharge passage being defined by a substantially vertical inner valve seat surface and being axially aligned with said valve inlet and outlet openings;

a movable valve plug adapted to fit within said discharge passage in a closed position, said valve plug being solid so as to be free of fluid passages therein and having a substantially vertical outer plug surface which slides across said inner seat surface during opening and closing of the valve; seal means for forming a liquid tight seal between said inner seat surface and said outer plug surface in the closed position of said plug, said inner seat surface and said outer plug surface wiping each other to remove material deposited thereon when said plug slides across said seat surface to enable sealing, said seal means including a plurality of elastic sealing members mounted on said valve seat within a plurality of annular grooves in said inner seat surface, each said groove having a restricted opening at the inner seat surface which is of less width than the groove to retain the sealing member within the groove after it is

inserted into said groove through said restricted opening; and

actuator means attached to said valve plug for raising and lowering the valve plug between its open and closed positions.

4,234,011

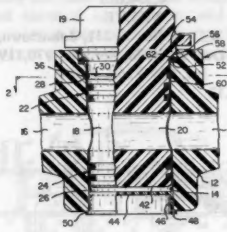
PLUG VALVE CONSTRUCTION

Earl A. Bake, Pittsburgh, and E. Frederick Schoeneweis, Coraopolis, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 861,249, Dec. 16, 1977, abandoned, which is a division of Ser. No. 636,873, Dec. 2, 1975, abandoned. This application Dec. 5, 1979, Ser. No. 100,316

Int. Cl.³ F16K *23/00, 5/04*

U.S. Cl. 137—312 **1 Claim**



1. An improved plug valve of the type which includes a valve body having a bore extending therethrough and a pair of passages intersecting said bore and being substantially normal to an axis of said bore; a valve plug disposed within said bore for selective rotation between an opened and a closed position to respectively align and misalign a port through said plug with said passages; and first circumferential sealing means between said plug and said bore axially spaced in one direction from said port and said passages and second circumferential sealing means between said plug and said bore axially spaced in the other direction from said port and said passages to prevent fluid from escaping from an interior of said plug valve and to balance fluid pressure acting on said plug; wherein said improvement comprises:

said body having a peripheral recessed shoulder around a first end of said bore;

said plug having a flared end section adjacent said recessed shoulder to define a circumferential groove therebetween;

said end section and said shoulder having opposed surfaces thereon which are inwardly converging toward a space between said bore and said plug adjacent said first circumferential sealing means and remote from said port; and

a resilient sealing ring being entrapped within said groove and normally compressively engaging said opposed surfaces to prevent ingress of foreign matter into said space and to limit said fluid pressure in said space if said first sealing means should fail.

4,234,012

HOSE SUPPORT BRACKET FOR BACKHOE SWING FRAME

Jesse L. Schupback, Durango, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 27, 1979, Ser. No. 33,771

Int. Cl.³ F16L *13/04*

U.S. Cl. 137—899.1 **9 Claims**

1. In a hydraulically controlled apparatus including first and second members interconnected by a pivot assembly defining a pivot axis extending in a first direction and about which the first member is pivotable in opposite second and third directions from a centered position, at least three hydraulic hoses extending generally through the pivot axis and having first ends supported on the first member and second ends connected to a hose support structure mounted on the second member and projecting therefrom in the first direction, an improved hose support structure comprising: a base portion secured to the second member, a support portion fixed to the base in a generally perpendicular relationship to the plane of the base portion; mounting portion means integral with the support portion and defining at least three notches with first and second ones of the three notches being located at opposite sides of

a plane containing the pivot axis and including the support portion and a third one of the notches being located away from the base a distance in the direction of a support portion axis which is different than the distance at which the first and second notches are spaced from the base; said support portion including said support portion axis and a bulkhead hose fitting releasably fixed in each of the notches and each of the hoses having a fitting at its second end connected to one of the bulkhead hose fittings.

4,234,013

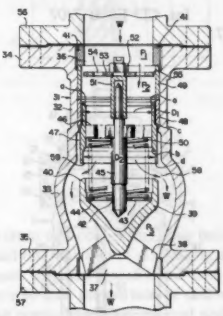
CONTROL VALVE FOR KEEPING THE RATE OF FLOW AT A FIXED VALUE

Sotokazu Rikuta, No. 24-7, 2-chome, Koun-cho, Maebashi, Gumma, Japan

Division of Ser. No. 829,548, Aug. 31, 1977, Pat. No. 4,174,584. This application Jun. 1, 1979, Ser. No. 44,739

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—504 **3 Claims**



1. A constant-flow fluid regulating valve comprising in combination:

a valve casing having inlet and outlet ports at spaced locations therein;

spring means mounted coaxially within said valve casing between said inlet and outlet ports;

a slide member positioned coaxially within said valve casing normally biased by said spring means towards said inlet port, the lower extremity of said slide member defining a first peripherally extending edge of an intermediate flow passage for fluids upstream of said outlet port, said slide member comprising a cylindrical valve plug, a guide bushing being provided within one end of said valve

casing and at least an axially extending portion of said valve plug being positioned concentrically within said guide bushing to slide therewithin, said valve plug having a transversely extending crosspiece secured fixedly therewithin, and the lower circumferentially extending edge of said valve plug comprising said first peripheral edge of said intermediate flow passage;

an orifice plate carried by said slide member for movement therewith within said valve casing and having at least one aperture therein for the flow of fluid therethrough from said inlet port; and

a guide member mounted fixedly and coaxially within said valve casing downstream of said slide member having a surface defining a second peripherally extending edge axially spaced from said first edge and defining therewith said intermediate flow passage, said guide member including a centering and support element fixedly mounted concentrically in said outlet port, a generally bowl-shaped guide element extending upwardly from said centering and support element and terminating in a circumferentially extending edge comprising said second peripheral surface of said intermediate flow passage, a transverse support plate being positioned within said guide element presenting a seat for one end of said spring means, the other end of said spring means bearing against said crosspiece;

whereby the force of said spring means tends to counterbalance fluid pressure differentials acting on the opposed faces of said orifice plate to thereby maintain the cross-sectional area of said intermediate flow passage and the rate of flow of fluid therethrough at a substantially constant value.

4,234,014

BOWL FOR COMPRESSED AIR OR GAS FILTER OR LUBRICATOR

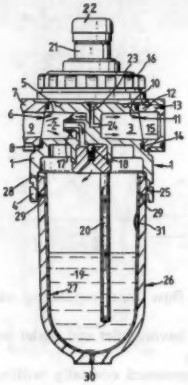
Roger E. Knight, London, England, assignor to IMI Norgren Limited, Warwickshire, England

Filed May 29, 1979, Ser. No. 43,211

Claims priority, application United Kingdom, May 31, 1978, 25373/78

Int. Cl.³ E03B *7/07*

U.S. Cl. 137—557 **15 Claims**



1. A compressed gas processing apparatus which includes a body having a gas inlet passage and a gas outlet passage, a bowl assembly supported by the body in fluid communication with the inlet and outlet passages, the improvement in the bowl assembly including:

an outer bowl having an impervious side wall made of high impact strength translucent material, said wall having an extremity at the top of said wall and an extremity at the bottom of said wall;

a thin flexible, impervious, translucent inner bowl having high resistance to chemical attach from chemicals within the processing apparatus, said inner bowl being positioned within and supported by and in substantially total surface contact with said outer bowl against the force of the compressed gas; and

vent means positioned only at at least one of said extremities of said side wall of said outer bowl and being of sufficiently small size that in the event of inner bowl failure, fragments from said inner bowl cannot pass through said vent means and said vent means will provide controlled venting of the compressed gas in the processing apparatus to the atmosphere.

4,234,015

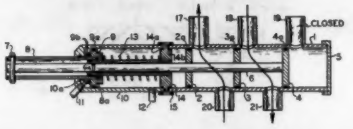
VALVE

Edwin K. Kintner, R.D. 4, Box A 231, Johnstown, Pa. 15905

Filed Dec. 18, 1978, Ser. No. 970,119

Int. Cl.³ F16K *27/04*

U.S. Cl. 137—625.18 **1 Claim**



1. A valve assembly for controlling the flow of a plurality of different liquids simultaneously in a single cylinder, comprising a fluid operated power unit housed in a first cylindrical housing portion enclosing an operating piston, a second cylindrical housing portion detachably secured to said first cylindrical housing portion so as to form an enlongated cylinder of the same diameter, three ports on one side and two ports on the other side of said second cylindrical housing portion, three longitudinally spaced pistons rigidly attached to the stem of said power operating piston so as to move in unison therewith and so that the central piston thereof will selectively change the direction of flow through said second cylindrical housing portion of two different liquids alternately outwardly through said two ports, the remaining two pistons being arranged to alternately close the remaining two of said three ports, the central port of said three ports being always the inlet port for one of said liquids while the remaining of said three ports being alternately the outlet port for the other of said liquids, and a sealed cap closing the end of said second cylindrical housing portion, being readily removable from said first cylindrical housing portion for separate cleaning,—said fluid operated power unit being the sole power unit for all three of said pistons.

4,234,016

ACCUMULATOR

Kunio Horino, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 926,388, Jul. 20, 1978, abandoned. This application Oct. 24, 1979, Ser. No. 87,800

Claims priority, application Japan, Jul. 20, 1977, 52-87142; Oct. 20, 1977, 52-140864

Int. Cl.³ F16L *55/04*

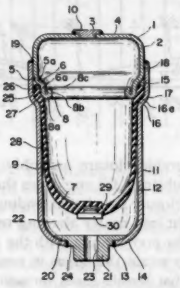
U.S. Cl. 138—30 **4 Claims**

1. In an accumulator which comprises a first hollow container having an opening at one end and an inlet for a working fluid at the other end, a second hollow container being jointed by welding at the opening with said first container so as to form a hollow space therewithin, and a flexible member dis-

posed in said hollow space and partitioning said hollow space into two compartments;

the improvement wherein said first container comprises a cylindrical body having said opening at one end thereof, and a bottom portion formed integrally with and extending from the opposite end of said cylindrical body and having said fluid inlet, said cylindrical body and said bottom portion being substantially uniform and identical in thickness, the upper portion of said cylindrical body being formed with a portion bent outwardly and a portion bent and further extending upwardly from said outwardly bent portion, said upwardly extending portion extending generally straightly to said opening;

said second container comprises a cylindrical body having one open end to be snugly inserted upon the inner surface of said first container and a top portion formed integrally with the opposite end of said cylindrical body, said cylindrical body and said top portion being substantially uniform and identical in thickness, said cylindrical body having a portion bent inwardly, a portion adjacent said inwardly bent portion and bent downwardly, and a curled



open end adjacent said downwardly bent portion, said bent portions and curled end of said cylindrical body of said second container being complementary in profile with said outwardly bent portion and said upwardly extending portion of said cylindrical body of said first container respectively so that there is defined an annular space between said first and second containers;

said flexible member having an annular shaped and thickened open end adapted to be held snugly in said annular space defined between said first and second containers;

said one open end of said first container being disposed at a substantial distance in the longitudinal direction toward said top end of said second container away from said annular space, whereby welding heat may be effectively dissipated until it reaches said annular shaped end of said flexible member, and the area near said annular shaped end of said flexible member may be permitted to be deformed smoothly along the smooth surface of said continuously curled end of said second container at the time of inflow of said working fluid through said inlet into said compartment.

4,234,017

ACCUMULATOR DEVICE OR THE LIKE

Jacques H. Mercier, Paris, France, assignor to Normand Trust, New York, N.Y.

Continuation of Ser. No. 919,893, Jun. 28, 1978, abandoned.
This application Nov. 5, 1979, Ser. No. 91,036
Int. Cl.³ F16L 55/04
U.S. Cl. 138—30 **13 Claims**

1. A pressure vessel comprising:

(a) a casing of rigid material having two closed ends with axially aligned ports and an internal vertical planar wall;

(b) a deformable separator disposed inside said casing between said ports to define variable volume fluid chambers on either side of said separator, said separator having a mouth and an annular bead therealong;

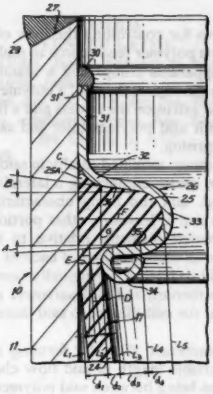
(c) an annular separator supporting member fixed to the internal vertical planar wall of said casing, said supporting member being of sheet material construction substantially thinner than said casing and including:

(i) a substantially cylindrical portion adapted to bear against the internal wall of said casing;

(ii) a smoothly curved hooklike portion defining a radially outwardly opening groove for accommodating said bead of said separator;

(iii) a connecting zone between said substantially cylindrical portion and said hooklike portion defining a wedge-shaped space with said internal wall, said bead being clampingly disposed within said wedge-shaped space in compressed condition to define a fluid-tight seal between said supporting member and said casing; and

(iv) an end portion at the end of said hooklike portion



remote from said connecting zone being radially spaced from said internal wall of said casing a distance equal to or greater than the undeformed wall thickness of said separator so that the portion of said separator between said end portion and said internal wall of said casing is not compressed by said end portion;

(d) said bead including a thickened zone facing said internal wall of said casing such that in undeformed condition it is of greater radial extent than the radial depth of said groove measured to the internal wall of said casing, and said radial depth of said groove having portions which are at least two and one-half times the distance between said end portion and said internal wall of said casing, said bead having a deep cut-away zone facing said end portion of said separator supporting member so that said deep cut-away zone compensates for said thickened zone and allows expansion therein of said bead during compression of said thickened zone so as to prevent pinching of said separator in the course of mounting it in said casing.

4,234,018

FLOW DISTRIBUTION VALVE SYSTEM FOR CONTROL OF EXTRUSION FROM MULTIPLE DIE ORIFICES

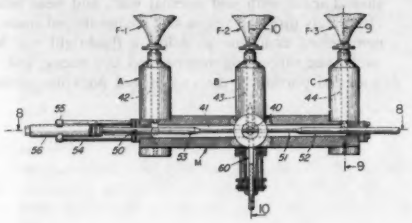
F. John Herrington, Jr., Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 849,050, Nov. 7, 1977, Pat. No. 4,170,450, and a continuation-in-part of Ser. No. 753,747, Dec. 23, 1976, Pat. No. 4,081,231. This application Nov. 24, 1978, Ser. No. 963,549

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.[3] F15D *1/06;* B29F *3/06*

U.S. Cl. 138—45 2 Claims



1. In an apparatus for controlling the flow of molten polymer from a common polymer feed source to multiple extrusion die outlets, said apparatus comprising a manifold having at least two extrusion die outlets thereon, a polymer inlet opening intermediate of said extrusion die outlets and a flow channel in communication with said polymer inlet and said outlets, the improvement comprising:

flow restriction means mounted axially in said flow channel, said restriction means comprising a laterally displaceable cylindrical rod, said rod being characterized by a narrower portion and at least one other portion of its length being of increased diameter relative to said narrower portion, the cross-sectional area of each of the respective portions of said rod being substantially constant throughout the length thereof, and said narrower portion gradually tapering at the end thereof to said increased diameter portion;

said portion of increased diameter forming an annular restriction of variable length in said flow channel, each of said restrictions being between said polymer inlet and one of said extrusion die outlets.

4,234,019

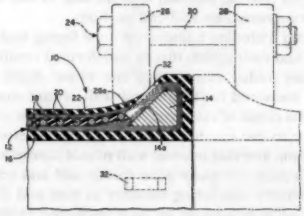
LUG BEAD HOSE

Harold G. Hornor, Cuyahoga Falls, and Karl K. Kluss, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 12, 1979, Ser. No. 2,911

Int. Cl.[3] F16L *11/08*

U.S. Cl. 138—109 3 Claims



1. An elastomeric hose adapted to be abutted to like hose and drawn together by external clamping means having a plurality of elastomer impregnated reinforcing plies and including a tapered flanged end which enlarges toward the end of the hose, said tapered end having a bead ring embedded therein which is enveloped by at least one of said reinforcing plies, said bead ring having an outwardly facing conical surface which tapers to a lesser dimension in a direction away from the end of the hose, at least one of said plies extending over said conical surface, said outwardly facing surface having at least two lugs projecting generally perpendicularly therefrom through those plies which extend over said conical surface such that external loading by the clamping means may occur directly on said lugs and be directly transferred to said bead ring.

4,234,020

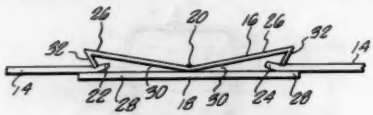
HEAT RECOVERABLE CLOSURE ASSEMBLY AND METHOD

Walter J. Greuel, Jr., Pleasanton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 6, 1978, Ser. No. 967,030

Int. Cl.[3] F16L *9/14*

U.S. Cl. 138—166 16 Claims



1. A heat recoverable closure assembly capable of being employed about a substrate for enclosure thereof, comprising

a heat shrinkable closure member extending to edges capable of being brought into nearly abutting relationship; and

fastening means for cooperating with the edges of said closure member to retain the edges in nearly abutting relationship such that tensile loads on said closure member will approach mutual alignment with constraining loads on said closure member from said fastening means including gripping means for retaining the edges of said closure member in nearly abutting relationship, each said gripping means having first and second leg members arranged together to define a channel for receipt of an edge of said closure member, means for forcing said leg members against said closure member near an edge thereof when interposed between said leg members and retaining means positioned within said channel and associated with at least one leg member for gripping said closure member when interposed in said channel.

4,234,021

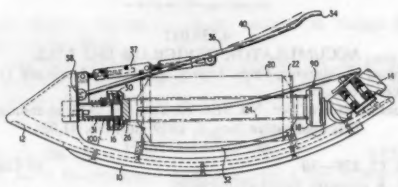
CIRCULAR LOOMS

Andrew K. Clokie, Dewsbury, England, assignor to Greenbat Limited, Leeds, England

Filed Dec. 20, 1978, Ser. No. 971,522

Int. Cl.[3] D03D *51/40*

U.S. Cl. 139—371 8 Claims



1. A circular loom, comprising a plurality of shuttles each adapted to traverse the same circular path in the loom, and each having a radio frequency transmitter adapted to issue a

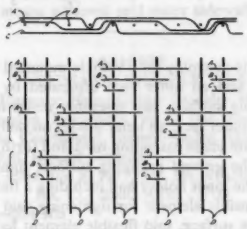
weft failure signal, said loom having a radio frequency detector located in a stationary position adjacent to the circular path of said shuttles and being adapted to be excited by a signal from any one of said transmitters, whereby weft failure in any one of said shuttles can be detected without physical contact between parts extending through the warp threads of said circular loom.

4,234,022

WOVEN FABRIC

Miyoshi Okamoto, Takatsuki; Syusuke Yoshida, and Shigeru Inada, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 7, 1978, Ser. No. 967,487
Claims priority, application Japan, Dec. 9, 1977, 52-147173
Int. Cl.³ D03D *15/00*
U.S. Cl. 139—420 R **13 Claims**



1. A woven fabric comprising a warp and at least three separate wefts woven with said warp, at least two of said wefts being floating wefts each comprising a yarn consisting mainly of extra-fine fibers or filaments having monofilament deniers of less than about 0.7, and another of said wefts comprising filamentary or spun yarn comprising mainly fibers or filaments of about 5–15 denier, and said warp comprising filamentary or spun yarn comprising mainly fibers or filaments of about 5–15 denier, wherein a greater portion of one of said floating wefts is exposed on one surface of said fabric than are the other wefts on said surface and wherein a greater portion of another said floating weft is exposed on the other surface of said fabric than are the other wefts on said other surface.

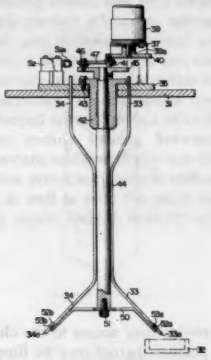
4,234,023

LIQUID FEEDER FOR AUTOMATIC CULTURE APPARATUS

Shinroku Sogi; Makoto Yoshinaga, both of Hachioji; Toshio Shinohara, Chofu; Takayuki Aihara, and Ikuo Tawara, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 876,894, Feb. 13, 1978, Pat. No. 4,179,339. This application Dec. 26, 1978, Ser. No. 973,117
Claims priority, application Japan, Mar. 2, 1977, 52-24766; Apr. 5, 1977, 52-41589; Apr. 5, 1977, 52-41592
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—99 **5 Claims**

1. A dual liquid supply switching system for a liquid feeder of automatic culture apparatus, comprising: a first crankpin disposed at a given eccentricity from an output shaft of a drive motor which is used for switching the liquid being supplied, the crankpin being arranged for rotation about the output shaft as the motor rotates, a driven shaft rotatably mounted on a stationary outer plate of an incubator for supporting respective discharge ports of a pair of liquid supply tubes at a phase difference of substantially 180°, the tubes being adapted to supply mutually different liquids; a second crankpin fixed to the driven shaft at an eccentricity therefrom which is greater than the eccentricity of the first crankpin; a link for interconnecting the first and the second crankpin to cause a reciprocatory rotating motion of the driven shaft about its own axis within an angular extent not greater than 180° as the motor rotates; a pair of microswitches disposed at the opposite ends of the angular extent of the driven shaft for stopping the drive



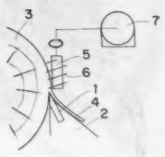
motor; and a switch operating member fixedly mounted on the driven shaft to operate the microswitches.

4,234,024

VENEER LATHE

Masaru Koike, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan

Filed Apr. 18, 1979, Ser. No. 31,326
Claims priority, application Japan, Apr. 20, 1978, 53-47457
Int. Cl.³ B27L *5/02*
U.S. Cl. 144—213 **19 Claims**



1. A veneer lathe for cutting off veneer from a log which comprises

(1) means for rotatably supporting said log about its axis;

(2) a knife provided near said log movably sideways away from and toward the log until the knife edge contacts the log surface in a tangential mode;

(3) a plurality of cylinders vertically juxtaposed in facing relation to the log periphery and each being provided with at least one edged thread thereon, the bottom end of each cylinder being located immediately ahead of the knife edge, said cylinders being adapted for axial rotation and lateral movement to and from the log; and

(4) pressure means provided between each two adjacent cylinders for pressing the log periphery slightly ahead of the knife edge and adapted for lateral movement to and from the log.

4,234,025

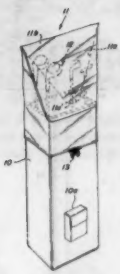
GOLF BAG CLUB COVER

Richard W. Berge, Rte. 1, Box 410 J, Gainesville, Va. 22065

Filed Aug. 3, 1979, Ser. No. 63,526
Int. Cl.³ A63B *55/00*
U.S. Cl. 150—1.5 R **5 Claims**

1. In combination with a golf bag, a cover for clubs contained within said bag comprising a flexible sheath with open top and bottom to slip over the top of said golf bag and con-

tained clubs, which sheath is provided with a large notch in a portion thereof with the top of the notch extending the width



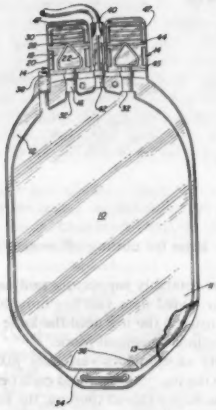
of the sheath to provide easy access to the clubs, and which sheath at the top portion thereof may be flipped downward over said notch and clubs.

4,234,026

SEAL FOR FLEXIBLE CONTAINER

Edward L. Bayham, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 5, 1979, Ser. No. 17,529
Int. Cl.³ B65D *41/32*
U.S. Cl. 150—8 **10 Claims**



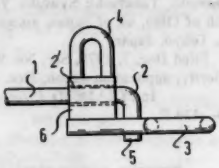
1. An openable seal member for a container, which comprises a tube extending across the sealed area for flow communication between said container interior and the exterior; a flexible plastic pocket member sealingly enclosing the outer end of said tube; tear means for opening said pocket member for access to said tube, said tear means comprising an added flexible sheet attached to said pocket member by a rupturable, essentially annular seal line which defines an outwardly-pointing apex, said added sheet further defining a free tab portion positioned outwardly from said apex, whereby said seal line may be ruptured, beginning at said apex, by pulling said tab portion to open said pocket member, said seal member also including a rupturable diaphragm positioned at the inner end of said tube, whereby the contents of said container cannot become entrapped in said tube prior to rupturing of the diaphragm.

4,234,027

TIRE-CHAIN ASSEMBLY

Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to Sesamat Anstalt, Chiasso, Switzerland

Continuation-in-part of Ser. No. 748,547, Dec. 8, 1976, Pat. No. 4,146,075. This application Dec. 20, 1978, Ser. No. 971,373
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2556115; May 17, 1976, 2611273; Nov. 5, 1976, 2650703
Int. Cl.³ B60C *27/06*
U.S. Cl. 152—213 R **22 Claims**



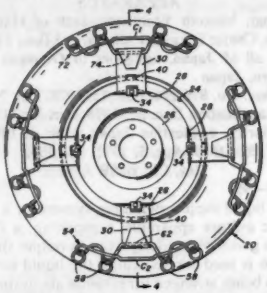
1. A tire-chain assembly for a vehicle-mounted wheel having an inner face and an outer face separated by a peripheral ground-engaging surface, said assembly comprising an outer holder on said outer face; an inner holder on said inner face; at least one traction chain extending back and forth between said holders over the ground engaging surface; tightening means connected to the inner holder and including a flexible substantially non-extensible element for tightening said chain on the groun engaging surface, said flexible element having one end for pulling by a user and another end; and means at least on said inner holder for securing said flexible element so as to arrest said tightening means and including first means mounting said other end of said flexible element for eliminating any longitudinal displacement of said other end relative to said first means when said flexible element is tightened, and second means fixedly located relative to said first means and operative for arresting said one end of said flexible element when the same is tightened.

4,234,028

TRACTION ASSEMBLY FOR VEHICLE WHEELS

Charles J. Leftault, Jr., 5100 Scenic Rd., Murrysville, Pa. 15668

Filed Apr. 7, 1978, Ser. No. 894,382
Int. Cl.³ B60C *27/02*
U.S. Cl. 152—233 **26 Claims**



1. An anti-skid vehicle wheel assembly comprising:
a wheel having a spider portion and a rim portion,
a tire having a pair of sidewalls and an interposed ground engaging portion,
said tire mounted on said wheel,
said wheel and said tire having outer sides adapted to face generally away from said vehicle when mounted thereon,

and inner sides adapted to face generally in the reverse direction,

at least two anchor means secured to said spider portion and disposed, at least in part, on said inner side of said wheel,

said anchor means being spaced generally equally circumferentially,

said vehicle wheel assembly having more than one traction means,

a said traction means secured to each said anchor means adjacent the inner tire sidewall,

said traction means extending beyond said tire ground engaging portion to the outer sidewall,

securing means for securing each said traction means adjacent said outer sidewall, and

said securing means being secured to said traction means but not to said wheel and comprising strap means lying in a plane extending generally perpendicular to the axis of said wheel for exerting a radially inward pull on the ends of the traction means adjacent said outer sidewall.

4,234,029

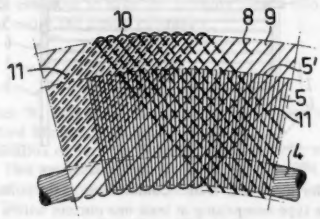
PNEUMATIC VEHICLE TIRE

Julius Peter, Hanover; Heinz-Günter Drössler, Hemmingen, and Willi Bachmann, Isernhagen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 8, 1977, Ser. No. 814,036

Int. Cl.³ B60C *9/00, 15/00*

U.S. Cl. 152—354 RB **13 Claims**



1. A pneumatic vehicle tire which includes bead portions, side walls, and a tread surface, each of said bead portions comprising in combination:

a bead core;

a single layer radial carcass of high strength material having one end portion thereof which is anchored in said bead portion by being looped around said bead core, that portion of said carcass which is looped around said bead core extending laterally outwardly of said bead portion over a portion up to approximately half of the height of the pertaining side wall;

bead reinforcing means located laterally outwardly of and next to said looped around portion of said carcass, said bead reinforcing means having free ends and comprising first strength carriers which are substantially parallel to one another and slanted with regard to the circumferential direction of said tire and to said carcass;

strip means associated with and extending radially inwardly to about the heel of said bead core as well as extending parallel to the radially outwardly lying free end of said bead reinforcing means, said strip means comprising second strength carriers which are substantially parallel to one another and oppositely slanted with regard to the circumferential direction of said tire, said first and second strength carriers crossing one another in such a way as to form a practically non-deformable triangular formation with said looped around portion of said carcass for maintaining the mutual spacing between the respective strength carriers, said practically non-deformable triangular formation providing uniform stiffening effect around bead core as well as over the entire height of said bead reinforcing means located laterally adjoining said bead core.

4,234,030

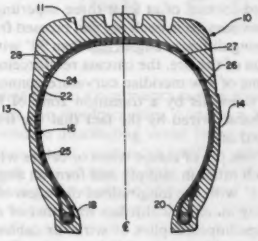
TIRE CARCASS STRUCTURE

John G. Van Nieuwal; Edward L. Montgomery, and Richard M. Beeghly, all of Cumberland, Md., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 18, 1978, Ser. No. 934,913

Int. Cl.³ B60C *9/10, 9/18*

U.S. Cl. 152—354 R **4 Claims**



1. A bias ply pneumatic tire comprising:

(a) a carcass of rubberized cord fabric;

(b) annular bead portions;

(c) sidewalls overlying lateral portions of said carcass and terminating at their radially innermost ends of the respective bead portions; and

(d) a tread overlying the carcass in the crown area of the tire, said carcass comprising at least one continuous ply of cord fabric, the cords of which begin near one bead portion and extend continuously from said one bead portion to the other bead portion near to which they terminate, the cords of each said continuous ply extending at an oblique angle relative to the axial direction of the tire, and at least one sectional ply of cord fabric the cords of which extend at an oppositely directed oblique angle relative to the axial direction of the tire, said sectional ply being composed of two sections of like continuous cord fabric, the cords of said sections being of substantially identical angle, one section beginning near one bead portion and extending into the crown beyond the circumferential centerline of the tire and terminating beyond said centerline an amount not exceeding three-fourths of the tire carcass sectional height, the other section beginning near the other bead portion and extending into the crown beyond the circumferential centerline of the tire an amount substantially equal to said one section, the sections of each sectional ply lying on the same side of any adjacent ply, each sectional ply lying nearer to the tread than any said continuous ply.

4,234,031

RADIAL TIRE WITH HIGH ANGLE, LOW ELONGATION PLIES AND LOW ANGLE, HIGH ELONGATION PLIES IN BELT

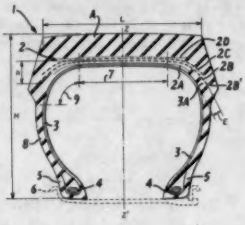
Jean Pommier, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed May 18, 1979, Ser. No. 40,204

Claims priority, application France, May 24, 1978, 78 15673

Int. Cl.³ B60C *9/20, 9/08*

U.S. Cl. 152—356 R **13 Claims**



1. A tire, particularly for heavy and very heavy carrier vehicles traveling off the road, having a tread, a carcass reinforcement formed of at least one ply of radial wires or cables anchored to at least one bead ring in each bead and a tread reinforcement arranged radially outward of the carcass reinforcement and formed of at least three superimposed plies of wires or cables parallel in each ply and crossed from one ply to the next forming different angles less than 90° with the longitudinal direction of the tire, the carcass reinforcement having an equatorial zone of low meridian curvature connnected on both sides to the sidewalls by a transition zone of high meridian curvature, characterized by the fact that the tread reinforcement is formed of

(a) at least one ply of elastic wires or cables which are parallel to each other in said ply and form an angle of between 5° and 15° with the longitudinal direction of the tire, said ply having an axial width less than that of the tread, and

(b) two superimposed plies of wires or cables of very low elongation which are parallel to each other in each ply and crossed from one ply to the next forming angles of between 50° and 70° with the longitudinal direction of the tire; that ply of wires or cables of very low elongation which is closest to the carcass reinforcement has an axial width greater than the axial width of the tread and extends into said transition zone and is separated from the carcass reinforcement in said transition zone by a layer of rubber whose thickness increases axially in the direction away from said equatorial zone.

4,234,032

ROLLER BLIND BOX

Gerd Stark, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Dyna Plastik-Werke GmbH, Bergisch Gladbach, Fed. Rep. of Germany

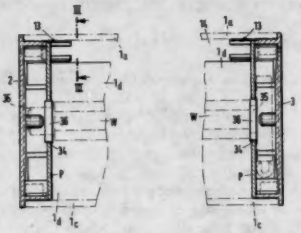
Filed Dec. 20, 1978, Ser. No. 971,638

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1978, 7806067[U]

Int. Cl.³ E06B *9/08*

U.S. Cl. 160—261 **7 Claims**

1. A roller blind box comprising four longitudinal walls; two face walls each having four strips projecting from one side thereof, one of said four strips being a lower strip, said two face walls being inserted between said longitudinal walls and kept in contact with said longitudinal walls by said four strips projecting from said one side of each said face wall; a respective spigot projecting from said one side of each said face wall for supporting a roller blind shaft having an axis, said face walls being symmetrical with respect to a vertical central plane substantially perpendicular to and containing the axis of the roller blind shaft; lateral roller blind guide rails and releasable guide members, said face walls being connected to said lateral roller blind guide rails via said releasable guide members; and



an insert opening in said lower strip of each said face wall in vicinity of corners for receiving a respective one of said guide members.

4,234,033

ROLLER DOOR AND FRAME COMBINATION

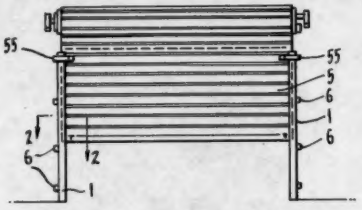
Simon Leivenzon, and Steven Leivenzon, both of Caulfield, Australia, assignors to Firmaframe Nominees Proprietary Limited, Cheltenham, Australia

Filed Mar. 7, 1979, Ser. No. 18,005

Claims priority, application Australia, Mar. 8, 1978, 44213/78

Int. Cl.³ E06B *9/08*

U.S. Cl. 160—133 **6 Claims**



1. A roller door and frame combination, said roller door being of the type comprising at least one curtain with a plurality of parallel spaced-apart corrugations arranged parallel with the axis of rolling of the curtain, the frame being of the type having elongate channel members for slidably receiving each side edge of the curtain over a major length of the height of the door opening and wherein the curtain is maintained in its corrugated shape by flexible wearing strips of material fastened to crests on one face of the curtain, at least one wearing strip being near one side edge of the curtain, and at least another being near the other side edge of the curtain, characterized in that there is resilient friction surface carried by the channel members for engaging with the face of the curtain which does not have the wearing strips fastened thereto and being of such size as to restrain the door against lateral back and forth movement in the frame and provide controlled resistance to sliding of the curtain within the channel members should the curtain thickness change.

4,234,034

CONTAINER AND COVER ARRANGEMENT

George J. Leitch, Newcastle-upon-Tyne, England, assignor to MacGregor International S.A., Basel, Switzerland

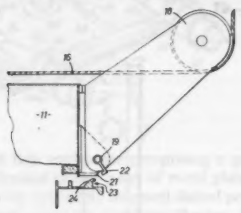
Filed Mar. 14, 1978, Ser. No. 886,400

Int. Cl.³ E05F *11/06;* **B63B** *19/24*

U.S. Cl. 160—193 **1 Claim**

1. A container and cover arrangement, the cover comprising

a plurality of cover elements, hinge means interconnecting adjacent ones of the cover elements adapted to permit pivotal movement of the cover elements outwardly of the container in response to a pulling force, the improvement comprising latching means comprising an engagement portion on the container and a latch element displaceably mounted on a cover element for co-operating latching engagement with the engagement portion, which latch element is displaceable in response to said pulling force prior to said movement of the cover elements to release engagement between the latch element and the engagement portion, pulling means coupled with said cover elements



and communicating said pulling force to said cover elements to open the container, direction changing means comprising a pulley mounted on the first cover element through which said pulling means passes, a pulley support arm mounted on said first cover element and carrying said pulley, a pivotal mounting for said pulley support arm on the first cover element at a position spaced from the pivotal axis of said pulley so as to permit pivoting of the arm upon application of a pull on said pulling means, wherein the pivotal mounting of said pulley support arm is arranged such that the weight of the arm and pulley is effective to urge the latching means into a latching position under the action of gravity.

4,234,035

TRIM LOCK

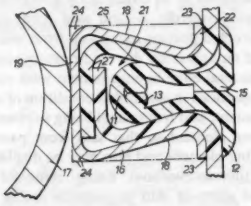
Frederick W. Babbs, Nottingham, England, assignor to Cox of Watford Limited, Nottingham, England

Continuation of Ser. No. 562,944, Mar. 28, 1975, abandoned. This application Jun. 10, 1976, Ser. No. 694,706

Claims priority, application United Kingdom, Mar. 28, 1974, 13835/74

Int. Cl.[2] A47H *13/00*

U.S. Cl. 160—392 **8 Claims**



1. An upholstered article comprising:

a frame defined by a structure frame member which extends around a part of the edge of the article and has a hollow section, said frame member having opposing walls having a single sharp edge at the inner side of each wall, said opposing walls defining a slot in the face of said frame member and leading to said hollow section;

trim retained in relation to said frame by having a free, flexible edge contained within said hollow section;

upholstery integral with the trim except at the edge of the trim and retained in relation to the frame by the trim; and

a single external strip pressing said trim against said sharp edges of said inner sides of said wall so as to grip said trim within said slot, said strip having a part extending into said slot and having a cross-section with an external flange for covering the outer face of said trim at a location adjacent said slot, a neck extending into said slot and a head carried on said neck, said head being wider than said neck and positioned on the inside of said slot to define a clearance space between said head and said hollow section wider than the thickness of the trim, said edge of said trim being free in said clearance space beyond the edges of said slot where it is gripped.

4,234,036

ARRANGEMENT AT A CONTINUOUS CASTING PLANT

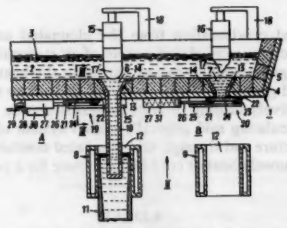
Ernst Bachner, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jul. 19, 1979, Ser. No. 59,066

Claims priority, application Austria, Aug. 4, 1978, 5671/78

Int. Cl.[3] B22D *11/10*

U.S. Cl. 164—420 **5 Claims**



1. In an arrangement at a continuous casting plant of the type including at least two mould cavities, a common tundish functioning as a common distributing vessel for supplying melt to said at least two mould cavities, an outflow opening in said tundish for each one of said at least two mould cavities, a stopper for closing said outflow opening, and a casting pipe reaching from said outflow opening into the mould cavity and including a casting pipe section projecting at the outer side of said tundish, the improvement which comprises shearing means provided at each casting pipe on the outer side of said tundish, said shearing means including a shearing head and a sealing plate following upon said shearing head, and an adjustment drive for moving said shearing means from a waiting position beside said casting pipe into a closing position in which said sealing plate covers said outflow opening on simultaneous shearing off of said casting pipe section projecting at the outer side of said tundish with said shearing head.

4,234,037

UNDERGROUND HEATING AND COOLING SYSTEM

Walter E. Rogers, Box 636, Lillington, N.C. 27546, and Preston C. Midgett, Rte. 1, Box 522, Spring Lake, N.C. 28390

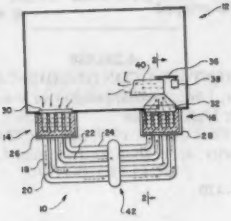
Filed Feb. 21, 1978, Ser. No. 879,232

Int. Cl.[3] F24J *3/02*

U.S. Cl. 165—3 **2 Claims**

1. A method of heating or cooling a structure by utilizing the natural earth as a source of energy to heat and cool, due to the mean temperature lag phenomenon, comprising the steps of: circulating a generally closed system of air through said structure; directing the generally closed system of air from said structure into and through the ground to a depth of approximately five to ten feet; directing the generally closed system of air through elongated conduit means disposed underground and within the natural earth at a depth of generally between five and ten feet and wherein the elongated conduit means extend generally horizontal through the earth within said depth range of approximately five to ten feet deep over a substantial area of earth such that there is substantial surface area contact between said elongated conduit means and the

natural earth; directing the air of said generally closed system through the elongated conduit means that extends generally horizontally through the natural earth within said depth range of approximately five to ten feet; effectuating a heat transfer between the air of said generally closed system of air and the natural earth lying adjacent said elongated conduit means such that the air is cooled when it is warmer than the adjacent earth and is heated when it is cooler than the adjacent earth; draining



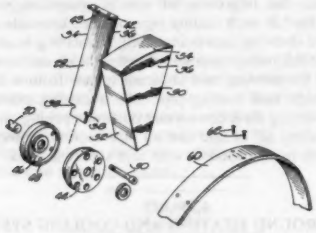
water and condensation from the elongated conduit means while said generally closed system of air is circulated through said elongated conduit means; directing the heated or cooled air of said generally closed system of air back to said structure for effectively heating or cooling said structure; and continuously circulating said generally closed system of air through said structure and through said elongated conduit means so as to continuously heat or cool said structure for a period of time.

4,234,038

TRANSFER WHEEL ASSEMBLY FOR AN AIR CONDITIONER AND METHOD OF MAKING THE WHEEL ASSEMBLY

Konstantins Dravnieks, Thiensville, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Aug. 17, 1978, Ser. No. 934,426
Int. Cl.³ F28D *19/04*
U.S. Cl. 165—10 **10 Claims**



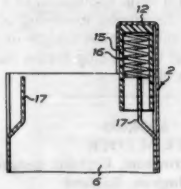
1. A transfer wheel assembly comprising, in combination,
a shaft defining an axis of rotation,
hub means operatively, associated with said shaft for rotation about said axis,
a plurality of blades projection radially relative to said axis and being planar in an axial direction and including opposite radially extending planar faces and generally axially facing and oppositely directed side portions,
means for providing engagement between said hub means and said blades, and
a plurality of sectors of condition transfer medium supported by said blade and being pervious to flow of a gaseous medium and capable of providing a condition transfer between itself and the gaseous medium flowing therethrough, each of said sectors being supported between two of said blades, and each of said sectors having opposed generally parallel axially facing faces and a pair of mutually diverging planar sides joining said faces, said planar sides facing said blades and at least one of said sides being cemented to one of said blades, and said blades including means for engaging said sectors and for locating said sectors with respect to said blades.

4,234,039

RADIATOR

Rune Almen, Halmstad, Sweden, assignor to Sensotherm AB, Sweden

Filed Mar. 31, 1978, Ser. No. 892,436
Claims priority, application Sweden, Apr. 1, 1977, 7703837
Int. Cl.³ F28F *9/00*
U.S. Cl. 165—67 **3 Claims**



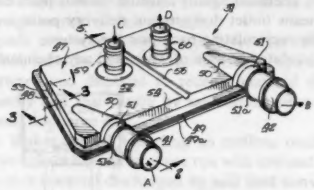
1. Radiator construction for mounting on a wall or like support comprising in combination a heating element and a front panel having an upper horizontal edge and a lower horizontal edge fitted on the front of said heating element and covering same thereat, said heating element having a plurality of projections adapted to be engaged by said front panel, said edges being bent inwardly behind said front panel with a downwardly directed portion extending from said upper horizontal edge and an upwardly directed portion extending from said lower horizontal edge in engagement with corresponding ones of said projections in assembled condition of said panel on said heating element, said front panel being substantially longer than said heating element so that said front panel may fully cover said heating element and also may be displaced laterally with respect thereto without being removed therefrom, wherein at least some of said projections are in the form of transversely offset tongue portions each having an abutment member disposed over a free end and spring means between each of said abutment member and the offset tongue portion associated therewith to thereby urge said abutment member against one of said upper and lower horizontal edges and others of said projections of said heating element are in the form of vertical grooves holding the portion extending from the other of said upper and lower horizontal edges with said spring means while urging said abutment members against said one of said upper and lower horizontal edges are also effective in urging the other of said upper and lower horizontal edges to remain held in said projections which are in the form of grooves.

4,234,040

TWO FLUID HEAT EXCHANGER

Charles S. Argyle, Willowdale; Robert G. Bamsey, Kitchener, and Gregory S. T. Millard, Brampton, all of Canada, assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 716,628, Aug. 23, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 918,198
Int. Cl.[3] F28F 3/12
U.S. Cl. 165—164 10 Claims



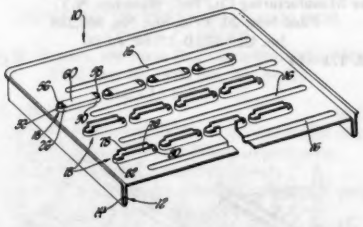
1. A two fluid heat exchanger comprising a generally flat heat exchanger formed of two pairs of metal plates, the inner pair of plates having oppositely disposed dished portions forming a chamber and joined by peripheral flanges, the chamber having an inlet and an outlet adapted to receive a first fluid, a heat transfer surface formed of at least one metal plate received in said chamber, and the outer pair of plates having oppositely disposed dished portions and peripheral flanges generally completely joined to the flanges of said inner plates, said outer dished portions cooperating with said inner dished portions to form a fluid envelope generally encompassing the chamber and having an inlet and an outlet to receive a second fluid therein, at least an oppositely disposed pair of side walls of said outer dished portions are spaced from side walls of said inner dished portions, said flanges of the inner plates extend between said inner and outer side walls to divide said envelope into upper and lower portions and have openings therein to provide communication between said upper and lower envelope portions, said second fluid inlet and outlet being located in one of the outer dished portions, and a central depression is formed in the same dished portion to extend across the dished portion and divide said upper envelope portion between the inlet and outlet into generally equal halves.

4,234,041

RADIATOR TANK HEADSHEET AND METHOD

William Melnyk, Lathrup Village, Mich., assignor to McCord Corporation, Detroit, Mich.

Division of Ser. No. 881,765, Feb. 27, 1978, Pat. No. 4,150,556. This application Nov. 15, 1978, Ser. No. 960,877
Int. Cl.[3] F28F 9/16
U.S. Cl. 165—173 1 Claim



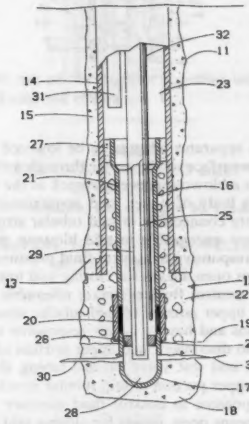
1. A headsheet for the tank of a tube-type heat exchanger comprising: a sheet of material, attachment means around the periphery of said sheet of material for attaching a tank over thereto, and a plurality of elongated apertures in said sheet of material for receiving the ends of flat tubes; each of said apertures including an integral ferrule for engaging the exterior of a tube, said ferrule including a pair of generally parallel sidewalls extending perpendicularly from the sheet of material and endwalls joining said sidewalls at the ends of said aperture, said endwalls joining said sidewalls at positions spaced from said sheet and having a constant height lesser than the height of said sidewalls and being characterized by having relatively few stretch-induced cracks, the height difference between the top of said endwalls at the juncture thereof with said sidewalls and the top of said sidewalls being approximately equal to one half the distance between said sidewalls.

4,234,042

DIRECT COMBUSTION STIMULATION OF A PRODUCING WELL

John W. Kirkpatrick, and Lawrence N. Mower, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 11, 1979, Ser. No. 2,496
Int. Cl.[3] E21B 43/243, 43/25
U.S. Cl. 166—261 6 Claims



1. A method for direct combustion stimulation of a production well for producing from a heavy oil or tar sand reservoir penetrated by said well, comprising the following steps:

a. placing casing carrying a sand screen into said well with said screen located opposite an upper zone of said reservoir,

b. placing a gravel pack in the space between said casing and said upper zone adjacent said well up to an elevation considerably above the top of said screen, and sealing said space above the top of said gravel pack,

c. establishing fluid communication between the lower part of said casing and a lower zone in said reservoir below said upper zone,

d. dividing the space within said well into two contiguous fluid passages substantially impervious to leakage therebetween, each of said passages communicating with the top of said well, one with said gravel pack and the other with said lower part of said casing, and

e. simultaneously forcing an oxygen-containing fluid through one of said passages and into said lower zone of said reservoir, and an aqueous divertent liquid through the other of said passages, through said gravel packing, and into said upper zone of said reservoir,

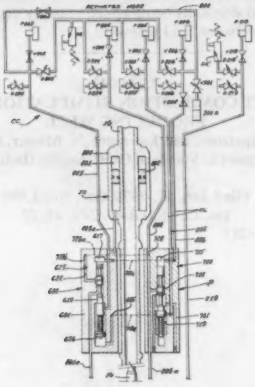
whereby organic material in said lower zone and near said well is warmed and its viscosity substantially reduced without thermal damage to said screen, so that at least some of said organic material may be subsequently removed through said well to increase the flow capacity of said well.

4,234,043

REMOVABLE SUBSEA TEST VALVE SYSTEM FOR DEEP WATER

William M. Roberts, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jan. 17, 1977, Ser. No. 843,154
Int. Cl.[3] E21B 7/12
U.S. Cl. 166—336 **74 Claims**



1. In subsea apparatus adapted to be lowered on a tubular string from the surface of the water through a riser pipe to a position within a blowout preventer stack at the top of a well bore beneath a body of water, said apparatus comprising: a tubular structure connectible in said tubular string, including test valve means engageable in said blowout preventer and having means responsive to control fluid pressure to hold said test valve means open; means for closing said test valve means upon relief of control fluid pressure; releasable latch means connecting an upper portion of said tubular structure to said test valve means and having means responsive to disconnect fluid pressure to disconnect said upper portion of said tubular structure from said test valve means; tubing shut off valve means in said upper portion of said tubular structure and having means responsive to control fluid pressure to hold said tubing valve means open; means for closing said tubing valve means upon relief of control fluid pressure; means for supplying control fluid to said test valve means and to said tubing valve means; means for supplying disconnect fluid to said latch means; and control means for relieving control fluid pressure from said test valve means, relieving control fluid pressure from said tubing valve means, and applying disconnect fluid pressure to said latch means.

4,234,044

CHEMICAL AGENT INJECTION SYSTEM FOR FIRE FIGHTING EQUIPMENT

Mark E. Hollan, and John J. Bayles, both of Oxnard, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 27, 1978, Ser. No. 946,003
Int. Cl.[2] A62C 35/00
U.S. Cl. 169—14 **8 Claims**

1. A chemical agent injection system for firefighting applications, comprising:

a. a water inlet manifold means operable to be connected to a water supply source;

b. a fire pump means having an inlet and an outlet and operable to pressurize water supplied thereto via said inlet and provide pressurized water via said outlet for downstream delivery;

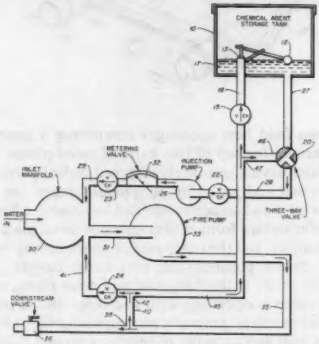
c. the output of said water inlet manifold means being connected to said fire pump means inlet;

d. a chemical agent storage tank operable to supply a chemical agent that can be injected into water from said water supply source at said water inlet manifold means;

e. injection pump means connected via chemical agent conduit means between said chemical agent storage tank and said water inlet manifold means for pumping chemical agents from said storage tank into said water inlet manifold means when desired for mixture therewith with the water;

f. conduit means for transporting pressurized water together with any chemical agents injected therein from said fire pump means outlet downstream delivery point and to a means for recirculating back into the system;

g. said recirculated portion of water and any chemical agent



CHEMICAL AGENT INJECTION SYSTEM FOR A FIRE FIGHTING SYSTEM WITH STANDOFF REMOTE OPERATIONS CAPABILITY.

being fed partially to said water inlet manifold means via a first recirculating conduit means and partially toward said storage tank via a second recirculating conduit means;

h. control means in conjunction with the second recirculating conduit means for selectively directing the flow of recirculating water through said storage tank to said injection pump means in a first mode of operation, and bypassing said storage tank with flow directly to said injection pump means in a second mode of operation; and

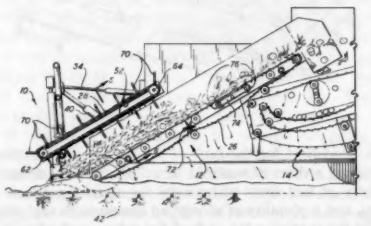
i. said recirculating water passing through said storage tank and injection pump means operating to purge the system of chemical agents; said recirculating water delivered to said injection pump preventing inadvertent dry operation of the injection pump.

4,234,045

HARVESTING MACHINE FEEDER APPARATUS

John R. Porter, Waterloo, N.Y., assignor to Porter-Way Harvester Manufacturing Co., Inc., Waterloo, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,284
Int. Cl.[3] A01D 17/04, 46/00
U.S. Cl. 171—14 **8 Claims**



1. Tomato harvesting apparatus for movement through a

field to gather both vines and fruit for subsequent separation of the fruit from the vines, as well as from dirt, rocks, weeds and other foreign matter, said apparatus comprising:

(a) means for lifting the fruit and vines, together with some foreign matter, from ground level and directing the same upwardly and rearwardly with respect to the direction of movement of the apparatus;

(b) an endless, feed conveyor chain having links spaced more closely than the smallest diameter of fruit to be recovered by the apparatus, and spaced to allow dirt and other small foreign matter to pass through;

(c) guide means establishing a path for said feed conveyor which includes an upper run extending upwardly from a forward end disposed to receive material directed upwardly and rearwardly by said lifting means to an elevated discharge end;

(d) a shaker section including an endless, oscillating conveyor chain having an upper run with one end disposed to receive material discharged by said feed conveyor;

(e) an endless, solid, planar belt having a lower run disposed in spaced, substantially parallel relation to said upper run of said feed conveyor and extending from a position forwardly of said forward end of said feed conveyor for a first portion of the length thereof, said belt including a plurality of cleats extending outwardly from the plane and across the width thereof at spaced intervals, whereby said cleats on said lower run of said belt extend toward said upper run of said feed conveyor to engage the upper portion of vines, and the like, being transported upon said feed conveyor;

(f) means for driving said feed conveyor and said belt in opposite directions with the lower run of said belt and the upper run of said feed conveyor moving in an upward and rearward direction; and

(g) means for imparting an oscillatory, shaking movement to a second portion of said upper run of said feed conveyor, between said first portion and said discharge end thereof to assist in dislodging foreign matter which may fall through said feed conveyor and in separating fruit from vines.

4,234,046

PRESSURE DIFFERENTIAL SEAFLOOR CORER-CARRIER

Harvey H. Haynes, 690 Mesa Dr., Camarillo, Calif. 93010

Filed Apr. 30, 1979, Ser. No. 34,220
Int. Cl.³ E21B 7/12
U.S. Cl. 175—6 **14 Claims**

1. A pressure differential seafloor corer-carrier for obtaining long core samples of seafloor sediments, comprising:

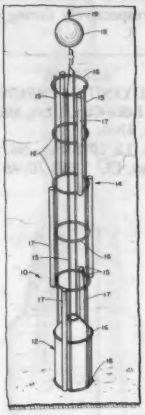
a. a space frame having a longitudinal axis;

b. a plurality of soil corers mounted lengthwise along the longitudinal axis of said space frame;

c. a pressure-differential pump unit connected to said space frame for driving said space frame and corers into the seafloor in a general direction along the longitudinal axis of said space frame;

d. said pump unit including means for pumping water and sediment from the seafloor through the pump unit to force said space frame and said soil corers into the seafloor;

e. said pump unit also including means for reversing the flow of water and sediment therethrough for backing said



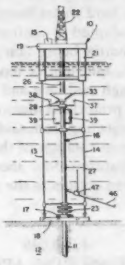
pump unit out of the seafloor together with said space frame and said soil corers.

4,234,047

DISCONNECTABLE RISER FOR DEEP WATER OPERATION

George E. Mott, Metairie, La., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,193
Int. Cl.³ E21B 7/128
U.S. Cl. 175—5 **5 Claims**



1. In an offshore system for drilling well bores through a well head in the ocean floor, and which includes;

a drilling vessel floatably positioned at the water's surface,

an elongated riser extending between, and connected at its opposed ends to the vessel and to the said well head whereby to define an elongated continuous passage therethrough,

pumping means on said vessel communicated with said riser for circulating a flow of drilling fluid therethrough during a well drilling operation, and opening means in said riser upper end for passing a rotating drill string through said riser to form said well bore in the ocean floor, the improvement therein of;

said riser including separable upper and lower segments,

remotely actuated coupling means being operable to removably engage said upper and lower segments to form said continuous passage, and

buoyancy means positioned on said riser lower segment to externally support said lower segment whereby to main-

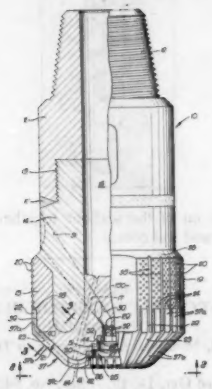
tain the latter in a substantially upright position when said lower segment has disengaged from the riser upper segment and regulating means for controlling the amount of drilling fluid which is retained in said riser upper and lower segments respectively during a disconnect of said segments.

4,234,048

DRILL BITS EMBODYING IMPREGNATED SEGMENTS

David S. Rowley, Salt Lake City, Utah, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Jun. 12, 1978, Ser. No. 914,449
Int. Cl.[3] E21B *10/46*
U.S. Cl. 175—329 **25 Claims**



1. A rotary bit for drilling bore holes in earth formations, comprising a body, a hard metal matrix secured to said body and providing a face adapted to confront the bottom portion of the bore hole, said matrix being fabricated at a temperature above about 2000° F., said matrix having preformed cavities therein opening through said face and produced during fabrication of said matrix, preformed diamond impregnated cutters in said cavities and projecting from said face to drill the bottom portion of the hole upon rotation of the bit, said cutters being fabricated at a temperature below about 1900° F., and means securing said preformed cutters to the walls of said preformed cavities.

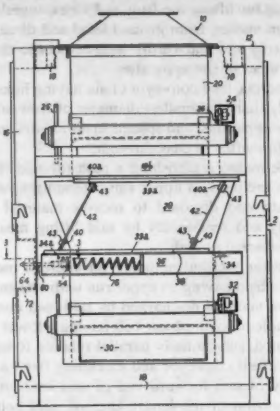
4,234,049

MASS MEASURING APPARATUS

George A. Oliver, P.O. Box 27096, Benrose 2011, Johannesburg, South Africa

Filed Aug. 23, 1978, Ser. No. 935,884
Claims priority, application South Africa, Aug. 23, 1977, 77/5085
Int. Cl.[2] G01G *13/00*
U.S. Cl. 177—105 **4 Claims**

1. A mass measuring apparatus comprising:
(a) a frame, including a plurality of cross-members;
(b) a hopper located within the frame and being adapted to receive matter the mass of which is to be measured and having closable discharge means at its lower end to discharge matter the mass of which has been measured;
(c) at least four pairs of attachment members secured one of each pair to the frame and the other of each pair to the hopper;
(d) at least four leaf springs extending between and being connected to the said pairs of attachment members respectively, the leaf springs being arranged in parallel disposition inclined to the vertical and the connection between each leaf spring and the attachment members being a two point connection so that the leaf spring cannot swing in its plane;
(e) a load cell operatively carried by the frame; and



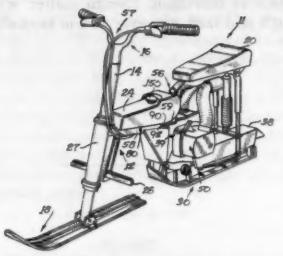
(f) a horizontal link operatively connecting the hopper to the load cell.

4,234,050

SNOW BOB WITH DETACHABLE FUEL TANK

Richard W. Condon, Frankfort, Ill., assignor to Roper Corporation, Kankakee, Ill.

Filed Nov. 1, 1978, Ser. No. 956,660
Int. Cl.[3] B60K *15/02*; B62M *27/02*
U.S. Cl. 180—190 **9 Claims**



6. In a power driven snow bob having a motor drivingly connected to an endless propulsion track carried by a rear power ski and with a frame carrying a seat at its rear end and having a cross frame portion to be straddled by the operator's legs and adapted to be steered by a steering post having a front ski attached to the lower end thereof, said cross frame having a substantially horizontal section and an angled section extending upwardly and rearwardly from the horizontal section, the improvement comprising a detachable fuel tank resting on an upper side said horizontal section of said cross frame portion and adapted to be straddled by the legs of the operator, said fuel tank having a groove in its underside for receiving therein the upper side of said horizontal section of said frame cross portion and for holding the tank against lateral movement, a releasable forward securing means at the forward portion of the fuel tank securing the forward portion of said tank to the frame, a rearward end of said fuel tank abutted against the upwardly and rearwardly angled section and being held thereby against rearward movement, a releasable rearward securing means securing the rearward portion of the fuel tank

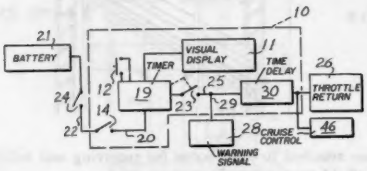
to said frame, said forward and rearward securing means constituting a quick connect and disconnect means for assisting in quick attachment or detachment of said fuel tank to said frame cross portion, and means releasably connecting said fuel tank to a fuel line extending to the motor.

4,234,051

DRIVER ALERTNESS DEVICE

Solon S. Morris, Jr., Rte. 1, Box 645, Smiths, Ala. 36877

Filed Jul. 26, 1978, Ser. No. 928,055
Int. Cl.³ B60K *31/00, 28/00*
U.S. Cl. 180—272 **7 Claims**



1. A driver alertness device, for a vehicle having a throttle, a linkage for positioning said throttle, said throttle having an idle position, said driver alertness device comprising counting means for decrementing from a given quantity towards a predetermined quantity, said predetermined quantity being lower than said given quantity, display means for displaying said given quantity and all decremented quantities in readable form, reset means for increasing the quantity of said counting means, said reset means comprising a button selectively operable by said driver for increasing the quantity by a predetermined increment or in multiple increments for selectively establishing a given quantity, switch means operable by said counting means when said counting means reaches said predetermined quantity, and throttle return means for placing said throttle at said idle position in response to the closing of said switch means.

4,234,052

METHOD AND APPARATUS FOR GENERATING SEISMIC IMPULSES USING HIGH PRESSURE WATER PUMP AS THE ENERGIZING SOURCE

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

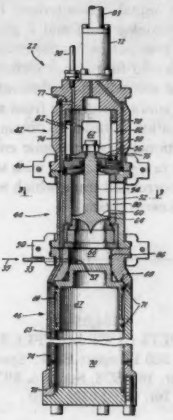
Filed Nov. 13, 1978, Ser. No. 959,562
Int. Cl.³ G01V *1/137, 1/38*
U.S. Cl. 181—120 **21 Claims**

1. A method for generating a powerful seismic impulse in a body of water comprising the steps of:

applying gas pressure in an operating chamber to an operating piston of a reciprocatable shuttle for moving the shuttle to close a charge chamber from at least one liquid discharge port;

pumping a substantially incompressible liquid into said charge chamber to push a piston follower into an energized piston against pressurized gas in a gas-propulsion chamber for compressing that pressurized gas, and subsequently

equalizing the gas pressure on opposite sides of said operating piston for suddenly moving said shuttle into an open position for causing said incompressible liquid to be forced abruptly through said liquid discharge port by said piston follower being driven forwardly from said energized position toward said port by the compressed pressurized gas expanding in said gas-propulsion chamber, and



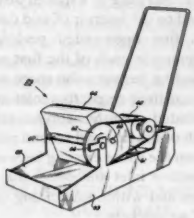
retaining said pressurized gas in said operating chamber and in said gas propulsion-chamber after said expansion has occurred.

4,234,053

SEISMIC EXPLORATION METHOD USING A ROTATING ECCENTRIC WEIGHT SEISMIC SOURCE

Otis G. Erich, Jr., La Habra, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 765,799, Jan. 4, 1977, Pat. No. 4,143,737. This application Nov. 1, 1978, Ser. No. 956,613
Int. Cl.³ G01V *1/14*
U.S. Cl. 181—121 **15 Claims**



1. A method for the seismic exploration of earth strata underlying an earth surface between a sourcepoint and a receiver location, which comprises:

(a) positioning on said earth surface at said sourcepoint a seismic source having (1) a first eccentric element which is rotatable about a first axis of rotation and (2) a position sensor comprised of a first sensor element and a second sensor element;

(b) rotating said first eccentric element and said first sensor element about said first axis of rotation at varying speeds, thereby transmitting into said earth strata a coded energy signal having a frequency variable code;

(c) positioning said second sensor element at a selected position about said first axis of rotation such that said first sensor element passes in close proximity to said second sensor element at and only at the instant at which the center of mass of said first eccentric element passes that angular position about said first axis of rotation at which

said seismic source develops the peak earthward force during each revolution of said first eccentric element;

(d) causing one of said first or second sensor elements to generate a code signal characterized by a substantially interference-free background and a plurality of discrete pulses, each of said pulses corresponding to one of the instants at which said first sensor element passes in close proximity to said second sensor element;

(e) sensing seismic energy returning from said earth strata to said receiver location in order to obtain raw seismic data which is proportional to said seismic energy; and

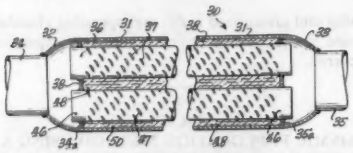
(f) correlating said raw seismic data with said code signal to thereby form a correlated trace which is indicative of the structure of said earth strata.

4,234,054

MULTI-DUCT MUFFLER

John S. Chapin, #19 360 Freeport Blvd., Sparks, Nev. 89431

Filed Apr. 18, 1978, Ser. No. 897,333
Int. Cl.³ F01N *1/10*
U.S. Cl. 181—252 **8 Claims**



1. A muffler for muffling noises of exhaust from a noise making machine including: (1) an elongated impervious casing having an inlet duct at one end and an outlet duct at the other end; (2) a first plate at a spaced distance from the inlet duct within said casing and fastened thereto around its inner circumference; (3) a second plate at a spaced distance from said outlet duct, and affixed to the interior of said casing about its circumference; (4) a first open-ended perforated tube extending through an opening in each of the first and second plates and intercommunicating between the space existing between each of said plates and their respective inlet and outlet ducts; (5) a second open-ended perforated tube extending through an opening in each of the first and second plates and intercommunicating between the space existing between each of said plates and their respective inlet and outlet ducts; and (6) a packing about said tubes and within said casing of a material having a multiplicity of air pockets.

4,234,055

MOBILE SUSPENSION SCAFFOLD SYSTEM

Gregory L. Beeche, RD #2, Smith Rd., Mechanicville, N.Y. 12118

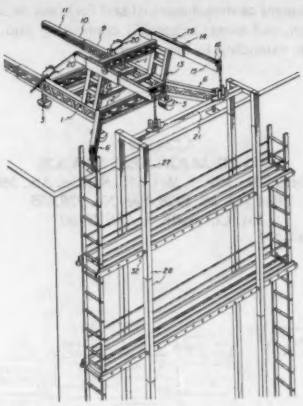
Filed Sep. 25, 1978, Ser. No. 945,103
Int. Cl.³ E04G *3/10*
U.S. Cl. 182—63 **19 Claims**

1. A mobile roof vehicle for use with a mobile scaffold system comprising:

a frame mounted on castors to allow universal rolling motion of the frame on the roof surface, said frame having a front, a rear and sides;

at least one telescoping boom attached to the frame and extending beyond the front thereof, said boom being adapted to hold scaffolding suspended therefrom;

means attached to each boom for suspending a scaffold-supporting cable therefrom; and



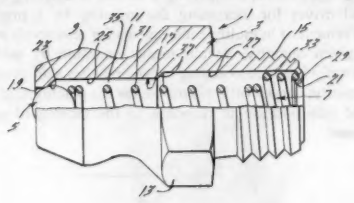
means attached to each boom for receiving and holding a scaffold-supporting pin.

4,234,056

LUBRICATION FITTING

Richard R. Farrell, Verona, Pa., assignor to CTS, Inc., Madison Heights, Mich.

Filed Nov. 2, 1978, Ser. No. 957,102
Int. Cl.³ F16N *23/00*
U.S. Cl. 184—105 B **6 Claims**



1. A lubrication fitting comprising a hollow hardened metal housing having a valve seat at one end and an annular flanged closure at the other end and an aperture extending between the seat and closure, said valve seat forming an inlet for lubricant and said closure having an opening in it forming an outlet for lubricant, a ball check valve on said seat, said ball valve being smaller in diameter than said outlet whereby said ball valve may be inserted into the housing through the opening after the closure is formed, a stepped two diameter helical coil valve spring compressed between the ball valve and the closure, said spring having a first diameter section comprising a plurality of uniform diameter coils adjacent the ball valve that are smaller in diameter than the outlet opening and contain the center of gravity of the spring and having a second diameter section comprising a second and smaller plurality of uniform diameter coils adjacent the closure that are larger in diameter than said outlet and adapted to be threaded past the closure during assembly, said coils of said first plurality being of substantially uniform diameter and the coils of said second plurality being of substantially uniform diameter, the coils of said second plurality being substantially in engagement with the wall of the aperture to provide lateral support for the spring, the first plurality of coils having a substantially greater overall length than the second plurality of coils, said housing having a microstructure at said closure produced by formation of said closure

prior to hardening of the housing, the first plurality of coils having at least two coils at the junction with the second plurality substantially engaging each other to provide a relatively stiff seat for a driver tool to apply axial force and torque to the spring in order to thread the second plurality of coils past said closure.

4,234,057

LIFT TRUCK HAVING A LOAD LIFTING ASSEMBLY

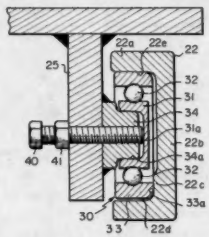
Masao Nakane, Handa, and Masahiko Nishii, Okazaki, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Sep. 13, 1978, Ser. No. 941,907

Claims priority, application Japan, Sep. 13, 1977, 52/123251[U]

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 E **9 Claims**



1. A lift truck having a wheeled body and a load lifting assembly mounted on the truck body, the load lifting assembly comprising:

a pair of laterally spaced-apart outer masts, each being made of a channel member having therein a channel and each being attached to the front end of the truck body;

a corresponding pair of inner masts, each being made of a channel member having therein a channel and each being telescopically fitted in the corresponding one of said pair of outer masts;

a load lifter arranged inwardly with respect to said pair of inner masts, and including a fork member for mounting thereon a load to be lifted and a lift bracket to which said fork member is attached;

a group of lift rollers arranged between said lift bracket and said pair of inner masts to permit said load lifter to move with respect to said pair of inner masts, each of said group of lift rollers comprising an annular outer

race member rotatably fitted in the channel of a corresponding one of said inner masts and having an outer flat surface contacting an inner central surface of said channel of said corresponding one of said inner masts for bearing a thrust force acting on said load lifting assembly during the lifting operation of said load lifting assembly, a cup-like inner race member for mounting each of said group of lift rollers on a support pin rigidly connected to said lift bracket, and a number of balls arranged between said inner race member and said outer race member, said inner race member comprising an annular race portion coaxial with said annular outer race member and an outer round bottom portion arranged on an outer end of said annular race portion; and

first screw means mounted on said bracket of said load lifting assembly for adjustably and outwardly axially pressing said outer round bottom portion of each of said group of lift rollers, so that said inner race member together with said outer race member of each of said group of lift rollers are adjustably and outwardly urged until said outer flat surface of said outer race each of said group of lift rollers contacts said inner central surface of said channel of said corresponding one of said pair of inner masts under an appropriate contact pressure.

4,234,058

WEAR ALARM DEVICE FOR A VENTILATED DISK BRAKE

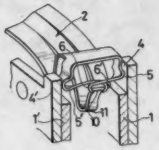
Masachika Yamamoto, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 7, 1978, Ser. No. 931,585

Claims priority, application Japan, Aug. 20, 1977, 52-111520[U]

Int. Cl.³ F16D *66/02*

U.S. Cl. 188—1 A **3 Claims**



1. A wear alarm device for a ventilation type disk brake having a ventilated disk with grooves on the outer periphery thereof, of the type in which when frictional brake pads mounted on backing plates reach a use limit in thickness, an elastic contactor is released to contact the peripheral portion of a rotating brake disk to generate an abnormal sound indicating excessive wear of said disk brake pads, the improvement comprising:

said elastic contactor comprising a leaf spring member comprising a first portion secured at a first end at a position radially adjacent the outer periphery of said ventilated disk and having a second end which is movable when released in a plane substantially parallel to the plane of said disk, said first portion being narrower than the grooves in the outer periphery of said ventilated disk to penetrate into said grooves when released, said first portion having a downwardly bent part located between said first and second ends for penetrating into said grooves, said downwardly bent part having a sufficiently large curvature as to prevent excessive penetration into said grooves, and at least one second portion extending from a region between said downwardly bent part and the second end of said first portion in the axial direction of said disk beyond said grooves to engage the disc periphery on opposite sides of the elastic contactor.

4,234,059

BRAKING SYSTEM FOR FREIGHT MODULE ON OVERHEAD GUIDE RAIL

Willi Schaad, Unterentfelden, Switzerland, assignor to Oehler Whylen Lagertechnik AG, Buchs near Aarau, Switzerland

Filed Nov. 17, 1978, Ser. No. 961,830

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1977, 2751367

Int. Cl.³ B61H *7/12*

U.S. Cl. 188—43 **3 Claims**

1. A braking system for a freight or crane module suspened for movement on an overhead guiding rail having the form of an I beam with upper and lower flanges and a vertical web comprising:

a pair of pivoted braking pincers for stopping the movement of said module along said rail, each of said pincers having a brake shoe and an upper arm portion for pushing said brake shoe against a side of the vertical web of the I beam and a lower arm portion which diverges outwardly and downwardly so as to be disposed with the lower arm portions of the pincers in pivotally joined relationship about a pivot pin located below the I beam;

said pivot pin pivotally mounting both upper arm portions about a horizontal axis parallel to the flanges of said I beam;

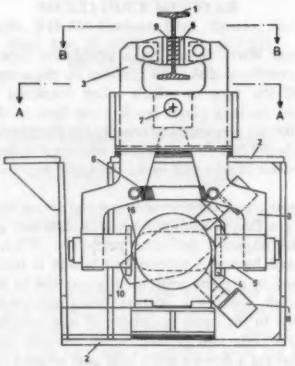
said brake shoes having a lining formed of plastic, one of said brake shoes being attached to each upper arm portion of said braking pincers, respectively, to press said brake lining of each shoe against opposite sides of the I beam and in the released state to have sliding characteristics therewith;

a tension spring connected to said pair of pincers;

said outwardly diverged lower arm portions of said braking pinsers having a first lower portion defining a first open area therebetween in the shape of a triangle and the tension spring engaging the pincers along the base of the triangle;

said outwardly diverged lower arm portions having a second lower portion defining a wider second open area therebetween generally rectangular in shape and lying below the base of the triangular open area;

a generally parallelogram shaped cam disc having contoured arcuate sides for spreading the lower arm portions outwardly by a rotation thereof and acting against the action



of said tension spring, said cam disc thereby providing a non-locking braking action by progressively increasing the brake action and urging said brake shoes against the vertical web of said I beam so that the clamping pressure rises unevenly from zero to a maximum;

base plates, one on each second lower portion, engaging the arcuate ends of said cam disc;

adjustable base plate spring means on said base plates forcing plates against the cam disc to assure quick braking action in a period of about 1 to 3 seconds;

said cam disc overcoming the pressure of said base plate spring means so that its rotation to a maximum clamping force is dampened progressively;

a spacer sleeve means housing said base plate spring means on said second lower portions;

servo motor means including an output shaft for rotating said cam disc between said base plates; and

support means on the freight module for said motor means, cam disc, and tension spring and said braking pincers.

4,234,060

BRAKE EQUIPMENT

Roger Barsted, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

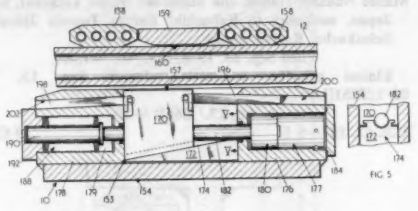
Filed Jun. 29, 1978, Ser. No. 920,502

Claims priority, application United Kingdom, Jul. 1, 1977, 27631/77

Int. Cl.³ F16D *65/06*

U.S. Cl. 188—44 **8 Claims**

1. Brake equipment for a vehicle or mining machine which in use traverses along a path adjacent to a stationary anchored rail, comprising first and second relatively movable jaws respectively providing co-acting first and second brake elements slidable along the rail and respectively mounted on opposite sides of the rail, first resilient means for urging relative movement of the first jaw transversely towards the rail such that, in use, the brake element of the first jaw is urged to contact the rail, and first fluid actuated means for urging the first jaw such that the first brake element is urged out of braking contact with the rail, the second brake element including a wedge assembly having a wedge component and a rail engaging component which, in use, when the second brake element is urged into contact the rail, upon contacting the rail the rail engaging



component is urged by relative movement of the components in the wedge assembly to increase the braking force of the second brake element on the rail, the wedge assembly comprising a resilient bias for urging the rail engaging component of the wedge assembly substantially along the rail relative to the wedge component towards a rail engaging position and second fluid actuated means for urging the rail engaging component of the wedge assembly out of a rail engaging position, when, in use, the first fluid actuated means urges the first jaw to urge the first brake element out of braking contact with the rail.

4,234,061

DISC BRAKES FOR VEHICLES

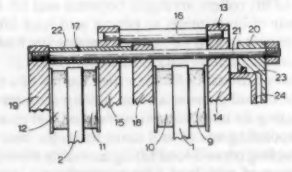
Hugh G. Margetts, and Keith M. Rouse, both of Leamington Spa, England, assignors to Girling Limited, Birmingham, England

Filed Dec. 4, 1978, Ser. No. 966,370

Claims priority, application United Kingdom, Dec. 2, 1977, 50295/77

Int. Cl.³ F16D *55/04*

U.S. Cl. 188—71.3 **8 Claims**



1. A disc brake for vehicles comprising a first axially fixed rotatable disc having an inboard face and an outboard face, a second axially fixed rotatable disc spaced axially from said first disc and having an inboard face and an outboard face, one of said discs being mounted inboard of the other of said discs, a pair of friction pad assemblies for engagement with opposite faces of each of said discs, and actuating means for applying said friction pad assemblies to said discs, wherein said actuating means comprises first and second separate clamp assemblies, the elements of each assembly being rigidly joined together when actuated means for mounting each of said clamp assemblies for relative movement in opposite axial directions, each of said clamp assemblies being adapted to apply one pad assembly of each pair to each of said first disc and said second disc, and a single common actuator acting between both said clamp assemblies to urge said clamp assemblies in said opposite

axial directions to apply all said friction pad assemblies to said discs.

4,234,062

MECHANICAL RELEASE MECHANISM FOR A SPRING-LOADED BRAKE CYLINDER

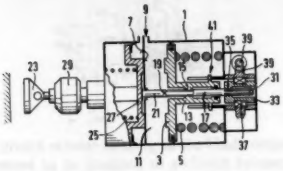
Albert Kerscher, Eching, and Walter Furtner, Rosenheim, both of Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,108

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2809263

Int. Cl.³ F16D *59/02*

U.S. Cl. 188—170 **2 Claims**



1. In a release mechanism for a spring-loaded brake cylinder particularly in an air braking system on a rail vehicle, a cylinder having a piston therein movable in braking and release directions and having one side acted upon by a spring and another side acted upon by a fluid pressure medium, a spindle shaft having a non-self-locking thread threadedly coupled to said cylinder, an actuating rod adapted to be connected to a brake linkage and engageable by said spindle shaft to be actuable thereby, a sleeve rotatably mounted on said cylinder and non-axially movable with respect thereto, said spindle shaft being axially movably connected to said sleeve and non-rotatable with respect to said sleeve, a drive mechanism operable exteriorly of the brake cylinder, and an overrunning drive means operatively connected between said drive mechanism and said sleeve and locking in driving position when the sleeve is rotated in a direction to unscrew the spindle shaft from said piston in the direction to release the brake.

4,234,063

BRAKE EQUIPMENT

Donald F. Blake, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

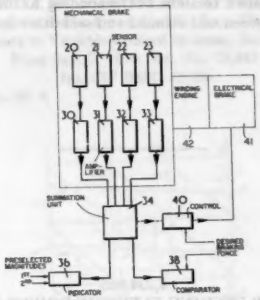
Continuation of Ser. No. 722,604, Sep. 13, 1976, abandoned. This application May 15, 1978, Ser. No. 905,926

Claims priority, application United Kingdom, Oct. 28, 1975, 44325/75

Int. Cl.³ B60T *8/00;* **F16D** *65/38*

U.S. Cl. 188—181 T **2 Claims**

1. Brake equipment for an underground mine winder having electrical brake equipment and mechanical brake equipment, comprising control means for releasing the electrical brake equipment when effective braking force of the mechanical braking equipment exceeds a preselected desired braking force, the mechanical brake equipment having a circular brake member and an assembly on opposite sides of the circular brake member and arranged to act in a calliper-like manner, brake shoes carried on the assembly, and operating means connected to the assembly for urging the assembly inwardly whereby the brake shoes contact and brake the circular brake member and the underground mine winder, plural strain sensing gauge devices mounted on the assembly for sensing strain in the assembly when the mechanical brake equipment is operated and for deriving strain signals when strain is sensed, a summation unit connected to the strain sensing gauge devices for summing derived strain signals to derive a total sensed strain signal indicative of sensed strain in the assembly, which is an effective braking force signal proportional to effective braking force of the mechanical braking equipment, an indicator means connected to the summation unit for receiving the effective braking force signal therefrom, whereby the indicator means indicates a warning when the effective braking force signal is less than a first preselected magnitude or is greater in magnitude than a second preselected magnitude, a comparator connected to the summation means for receiving the effective braking force signal therefrom, a desired braking force signal connected to the comparator, whereby the comparator compares the effective braking force signal with the desired braking force preselected magnitude, the control means being connected to the summation unit, the desired braking force signal and to the electrical braking equipment for permitting release of the electrical braking equipment when the effective braking force exceeds the desired braking force preselected magnitude for ensuring that the electrical braking equipment is not released unless the effective braking force the greater than the desired braking force.



4,234,064

SLACK ADJUSTER MEANS

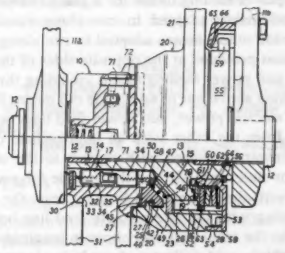
Geoffrey R. Tregoning, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., England

Filed Jan. 8, 1979, Ser. No. 1,420

Claims priority, application United Kingdom, Jan. 6, 1978, 00431/78

Int. Cl.³ F16D *65/56*

U.S. Cl. 188—196 BA **11 Claims**



1. Slack adjusting means to provide for automatic slack adjustment or compensation along an arcuate path, the slack adjustment means comprising an input member movable arcuately in a first plane, an output member movable arcuately in a second plane parallel to or coplanar with the first plane, and a coupling element for transmitting a braking force from the input member to the output member, characterised in that the input and output members are constrained against relative displacement in a direction transverse to the said first and

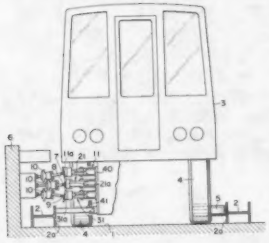
second planes, and in that the element is positively engaged with one of said members via co-operating helical engagement means (e.g. helical keying means) and the element is engageable or engaged with the other of said members via co-operable clutch faces arranged to be retained in force-transmitting engagement by the reaction forces in the co-operating helical engagement means when the said members tend to rotate relatively in one direction, and to be disengageable as said reaction forces are removed or relieved when the said members tend to rotate relatively in the opposite direction thereby to permit relative rotation, corresponding to the slack to be taken up, between said element and said other member.

4,234,065

MEANS FOR FEEDING ELECTRIC POWER TO TRACK GUIDED VEHICLES

Yukio Uozumi, and Masaharu Yagi, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed May 21, 1979, Ser. No. 41,105
Claims priority, application Japan, May 22, 1978, 53-61193
Int. Cl.[3] B60M *1/34*
U.S. Cl. 191—29 R **6 Claims**



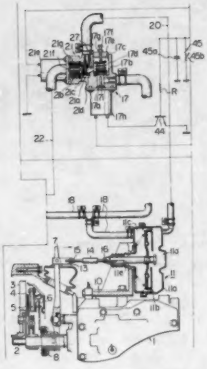
1. Electric power feeding means for a guided vehicle having running wheel means adapted to run along running track means and guide wheel means adapted to run along a pair of guide rail means provided at the opposite sides of the running track means, said power feeding means including three power feed lines located above one of said guide rail means for receiving supply of electric power, said power feed lines being vertically spaced from the other with an intermediate one being transversely inwardly shifted with respect to the other feed lines, collector shoes provided on the vehicle for respectively cooperating with the power feed lines, at least the collector shoe cooperating with the intermediate feed line being offset with respect to the other collector shoes in longitudinal direction of the vehicle, said collector shoes being located so that they lie in tangential planes of an imaginary cylinder and being of such lengths that they are maintained in contact with the cooperating power feed lines when there is an ordinary angle of rolling movement of the vehicle, insulative shoes respectively associated with the collector shoes and coplanar with the associated collector shoes, said insulative shoes being of such lengths that they are maintained in contact with cooperating power feed lines even when there is an abnormally large rolling of the vehicle.

4,234,066

DUAL STAGE FLUID CLUTCH MOTOR WITH ELECTRIC CONTROLS INCLUDING TIME DELAY

Hiroshi Toyota, 1308, Kozukue-cho, Kohoku-ku, Yokohama; Tamio Kawamoto, 1218-6, Fuchinobe, Sagamihara, and Etsusou Takehiro, 788-1, Shirane-cho, Ashai-ku, Yokohama, all of Japan

Continuation of Ser. No. 789,859, Apr. 22, 1977, abandoned.
This application May 25, 1978, Ser. No. 909,642
Claims priority, application Japan, May 20, 1976, 51-58254
Int. Cl.[2] F16D *67/00*
U.S. Cl. 192—0.092 **5 Claims**



1. Vehicle transmission comprising:

a clutch actuatable by a clutch actuator;

fluid network means connecting said clutch actuator, a source of high pressure and a source of low pressure;

solenoid actuated clutch release valve means having a solenoid for connecting said clutch actuator to said source of low pressure when a solenoid thereof is energized and for connecting said clutch actuator to said source of high pressure when said solenoid is not energized;

solenoid actuated air-on valve means having a solenoid and fluidly disposed in said fluid network means intermediate of said solenoid actuated clutch release valve means and said source of high pressure for opening fluid communication between said solenoid actuated clutch release valve means and said source of high pressure when a solenoid thereof is energized and for blocking fluid communication between said solenoid actuated clutch release valve means and said source of high pressure when the solenoid thereof is not energized and

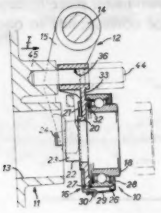
circuit means whereby said solenoid of said clutch release valve means and said solenoid of said air-on valve means are simultaneously energized but said solenoid of said air-on valve means is kept energized for a predetermined time after said solenoid of said clutch release valve means has been deenergized, said circuit means including delay means for permitting current to be supplied to said solenoid of said air-on valve means for said predetermined time after current to said solenoid of said clutch release valve means has beencut, and a transistor electrically in circuit with said solenoid of said air-on valve means having its base in circuit with said delay means, said delay means comprising a condenser and a resistor, a time constant determined by said condenser and said resistor being said predetermined time.

4,234,067

CLUTCH RELEASE BEARING

Rene Billet, Lamorlaye, France, assignor to Societe Anonyme Francaise du Ferodo, France

Filed Dec. 27, 1977, Ser. No. 864,803
Claims priority, application France, Dec. 30, 1976, 76 39540; Dec. 9, 1977, 77 37119
Int. Cl.[3] F16C *33/30*
U.S. Cl. 192—98 14 Claims



1. A clutch release bearing of the kind comprising an operating element to be coupled to a clutch release fork, a driving element cooperable with a release mechanism for operating a clutch, and an antifriction bearing operatively disposed between said operating and driving elements, and means for mounting said anti-friction bearing on said operating element relative radial movement and for permitting self centering of said anti-friction bearing in the course of normal operation in case of misalignment, and guide means for guiding said clutch release bearing for axial displacement, said guide means being the sole guide means for said clutch release bearing and being disposed exclusively laterally offset from the axis of said clutch release bearing and comprising lateral guide passages formed in said operating element cooperable with fixed guide elements for defining an axial path of displacement of the entire release clutch bearing.

4,234,068

TORSION DAMPING ASSEMBLY ESPECIALLY FOR A FRICTION CLUTCH PLATE ASSEMBLY

Raymond Le Brise, Montmorency, France, assignor to Societe Anonyme Francaise du Ferodo, France

Filed Aug. 22, 1977, Ser. No. 826,958
Claims priority, application France, Aug. 25, 1976, 76 25666
Int. Cl.[3] F16D *3/66*
U.S. Cl. 192—106.2 12 Claims

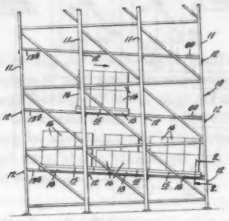
1. A friction clutch plate assembly comprising a hub, a web extending radially outwardly from said hub, two identical annular guiding plates, one said annular guiding plate on each side of said web, cross members interconnecting said annular plates, said annular plates being mounted for predetermined angular displacement relative to said web of said hub, a friction disc secured to a first of said annular plates through a plurality of passages at the outer periphery thereof and carrying friction linings at its periphery, a circumferential array of resilient means interposed between said web and said annular plates, and friction shoe means disposed between said web and the other of said annular plates being operative over at least a portion of the limited relative angular displacement thereof, means for securing said friction shoe means through passages in said other annular plate which are identical with said plurality of passages in said first annular plate.

4,234,069

VEHICLE SPEED CONTROL APPARATUS

Frederick G. Seiz, Telford, and Carl G. Seiz, Hatfield, both of Pa., assignors to Variable Control Systems, Inc., Telford, Pa.

Filed Sep. 7, 1979, Ser. No. 73,445
Int. Cl.[3] B65G *13/00*
U.S. Cl. 193—35 A 51 Claims



1. Speed control apparatus for a vehicle comprising:
means providing a wheel housing,
at least one control wheel disposed in said housing,
means mounting said control wheel for rotation and axial motion about an axis,
said control wheel having an inner camming surface tapering radially and axially outward from said axis and having a braking surface spaced axially from said camming surface,
friction means carried by said housing for slidably engaging said braking surface as it rotates and for cooperating therewith to apply friction to said control wheel,
rail means engaging said camming surface for urging said braking surface of said one wheel axially outward against said friction means in response to a load, and
at least one reaction wheel carried by said housing for rotatably applying to said housing a reaction force opposite in direction to the outward axial force applied by said control wheel,
whereby the speed of the vehicle is controlled by causing the friction means to retard rotation of the wheel.

4,234,070

VENDING CONTROL APPARATUS

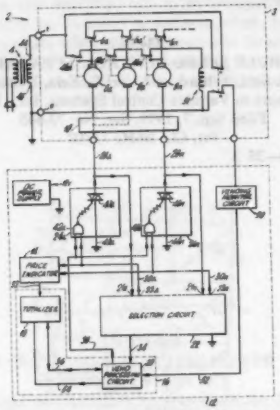
Frederic P. Heiman, Philadelphia, Pa., assignor to Mars, Inc., McLean, Va.

Filed Oct. 18, 1977, Ser. No. 843,287
Int. Cl.[2] G07F *11/00*
U.S. Cl. 194—1 N 26 Claims

1. A vending machine comprising a plurality of alternating current actuators, each individually controlled for the dispensing of a customer selected product;
a selection switch for activation by a customer in selecting the desired product;
an alternating current supply for the actuators, having a first output terminal connected to a common terminal;
selection circuit means responsive to a switch signal from the selection switch for generating a selection signal indicating the product category selected;
credit indicating means for producing a signal indicative of the credit to be accorded to the customer;
price indicating means responsive to the selection signal for

producing a signal indicative of the price of the customer selected product;

a calculating section responsive to the credit indicating means and the price indicating means for comparing the amount of customer credit with the price of the selected product and for generating a vend signal in appropriate response thereto;



a direct current power supply for the selection circuit means having one power output terminal connected to the common terminal; and

actuator control means responsive to the vend signal from the calculating section for activating the actuator corresponding to the selected produce to dispense the product, the actuator control means including an electronic power switch for activating the corresponding actuator by connecting the actuator to the common terminal.

4,234,071

DEVICE FOR CHECKING METAL PIECES, PARTICULARLY COINS

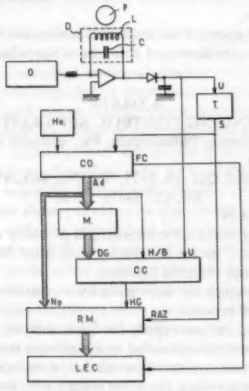
Son Le-Hong, Villebon sur Yvette, France, assignor to Compagnie de Signaux et d'Enterprises Electriques, Paris, France

Filed Nov. 2, 1978, Ser. No. 956,921

Claims priority, application France, Nov. 3, 1977, 77 33014

Int. Cl.³ G07F *3/02*

U.S. Cl. 194—100 A **8 Claims**



1. A device for checking metal pieces, particularly coins, characterized in that it comprises, in combination an electromagnetic detector responsive to the passing of metal pieces and formed by a tank circuit fed from an alternating current generator of constant effective output, means for passing pieces adjacent to the detector, means for measuring at predetermined periods of time the voltage value at the detector as influenced by variations in the impedance of the tank circuit as a result of the passing of the pieces, and means for comparing the thus measured voltge values with one or more sets of programmed voltage values previously stored in a memory, each said set defining a time-dependent voltage profile characteristic of a detected known metal piece to determine whether or not each passing piece corresponds to one of the known pieces.

4,234,072

ELECTRONIC COIN TESTER WITH CONTROLLED MECHANICAL TESTING DEVICE

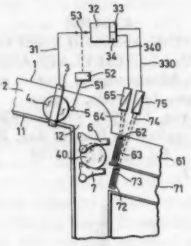
Georg J. Prümm, Koelner Strasse 235, 5275 Bergneustadt, Fed. Rep. of Germany

Filed Dec. 1, 1978, Ser. No. 965,302

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1977, 2753691; Mar. 25, 1978, 2813061; Apr. 3, 1978, 2814258

Int. Cl.³ G07F *3/02*

U.S. Cl. 194—100 A **9 Claims**



1. Coin testing apparatus for plural denominations of coins, characterized by the combination of

a. an electronic measuring and evaluating circuit monitoring a guide duct for coins,

(1) said circuit producing an output signal of defined duration and characteristic for a recognized genuine coin,

b. and a mechanically operating sorting device for distinguishing between genuine and nongenuine coins on the basis of an examination of the physical dimensions of the coins,

(1) one of said mechanically operating sorting devices being provided for each denomination of coin being accepted by said coin testing apparatus,

(2) said mechanically operating sorting devices being selectively energized electrically to perform its sorting function by the output of said electronic measuring and evaluating circuit on the basis of the denomination of coin recognized by said circuit.

4,234,073

AERIAL CONVEYOR SYSTEM

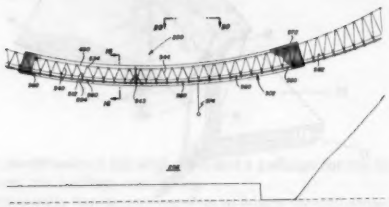
Charles R. Satterwhite, 5539 Harvest Hill, #1121, Dallas, Tex. 75230

Continuation-in-part of Ser. No. 620,929, Oct. 9, 1975, Pat. No. 4,101,019, which is a continuation of Ser. No. 413,537, Nov. 7, 1973, abandoned. This application Jul. 10, 1978, Ser. No. 923,394

The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.

Int. Cl.³ B65G *41/00*

U.S. Cl. 198—304 **19 Claims**



1. An aerial conveyor system, comprising:

a first cable extending from one end at a material receiving zone over an open area to another end at a material discharge zone;

a plurality of conveyor belt support rollers each positioned below and transverse to the first cable, said conveyor belt support rollers defining a course between the material receiving and discharge zones;

an endless conveyor belt supported substantially parallel to and beneath the first cable for movement around the course defined by the conveyor support rollers;

means for maintaining a predetermined minimum tension in the first cable;

means for mounting said support rollers in spaced apart relationship with at least one of the endmost support rollers being movable relative to the other endmost roller in the direction of conveyance for tensioning the conveyor belt;

means for adjustably supporting the conveyor belt support rollers from the first cable such that the support rollers may be raised and lowered relative to the first cable;

means for applying axially outwardly directed forces to opposite ends of the mounting means to urge the endmost rollers apart from each other; and

drive means including one of the endmost conveyor support rollers for driving the conveyor belt around the course.

4,234,074

APPARATUS FOR SEPARATING METAL CUTTINGS FROM LIQUID COOLANTS

William F. Martin, Tulsa, Okla., assignor to James A. Herring, Tulsa, Okla., a part interest

Filed Jun. 30, 1978, Ser. No. 920,658

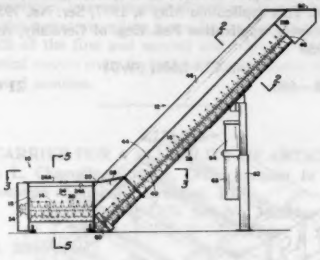
Int. Cl.³ B65G *33/14*; B03C *1/30*

U.S. Cl. 198—558 **8 Claims**

1. In an apparatus for conveying solid objects from a lower to a higher elevation having an upwardly inclined elongated housing having a solids discharge chute at the upper end and means at the lower end for receiving solid objects and having a rotatable auger in the upwardly inclined housing of external diameter slightly less than the diameter of the housing semi-circular bottom, an improved configuration of the housing whereby entangling solids, such as long machine cuttings, are more efficiently moved upward by the auger for deposit of the solids out through the discharge chute, the improvement comprising:

the housing being defined in cross-section by a semi-circular bottom of internal diameter slightly greater than the external diameter of said auger, the semi-circular bottom having opposed upper edges;

a horizontal ledge having one edge affixed to the one of said upper edges of said semi-circular bottom;



a first sidewall having the lower edge affixed to the other of said upper edges of said semi-circular bottom; and

a second sidewall having the lower edge affixed to the other edge of said horizontal ledge, the sidewalls being spaced apart, the top of said sidewalls being above said auger providing an area above said auger for moving solids through said housing.

4,234,075

APPARATUS FOR SEALING A CONNECTION BETWEEN TWO MUTUALLY SHIFTABLE COMPONENTS

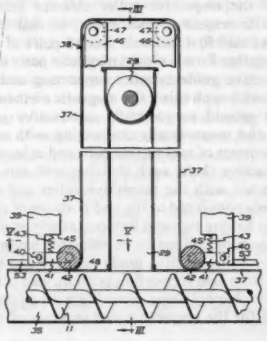
Karl A. L. Tingskog, Helsingborg, Sweden, assignor to AB Siwertell, Bjuv, Sweden

Filed Apr. 25, 1979, Ser. No. 33,642

Claims priority, application Sweden, Apr. 27, 1978, 7804841

Int. Cl.³ B65G *15/22, 21/10*

U.S. Cl. 199—594 **11 Claims**



1. An apparatus for sealing a connection between a first conveyor and a second conveyor which has a housing with an elongate opening, one of said conveyors being movable relative to the other conveyor in the longitudinal direction of the elongate opening, said first conveyor including a connecting portion which communicates with said second conveyor, a lid device which seals the opening and is formed of a web of flexible material extending in the direction of the elongate opening, said web including a loop which extends around said connecting portion of the first conveyor, guide means connected to and movable with the first conveyor for successively lifting the web away from and laying the web down over the elongate opening in response to relative movement between the conveyors in the longitudinal direction of the elongate opening.

4,234,076

MAGNETIC ROLLER CONVEYOR

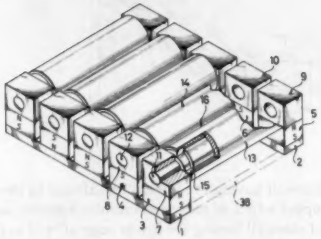
Heinrich Spodig, Netteberge 202, 4714 Selm-Bork, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 790,140, Apr. 22, 1977, abandoned. This application May 4, 1977, Ser. No. 793,866

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2617939

Int. Cl.³ B65G *39/08*

U.S. Cl. 198—690 **21 Claims**



1. A magnetic roller conveyor for transporting magnetically conductive objects, comprising at least two magnetically conductive roller elements each having an axis, each of said roller elements having a first end portion and a second end portion axially spaced from one another; and a magnetic system for polarizing said roller elements including at least a first pair of magnetic elements located adjacent and magnetically connected with each other and to said first end portions of the respective roller elements, and at least a second pair of magnetic elements located adjacent to and magnetically connected with each other and to said second end portions of the respective roller elements, the magnetic elements of each of the pairs being differently polarized with respect to each other, and the magnetic elements of each of said first and said second end portions of the respective roller element being identically polarized with respect to each other, so that said two roller elements and said first and said second pairs of said magnetic elements together form a closed magnetic path; a first magnetically conductive guide member supporting and magnetically connecting with each other the magnetic elements of said first pair, and a second magnetically conductive guide member supporting and magnetically connecting with each other the magnetic elements of said second pair; and at least two magnetically conductive shafts each defining said axis and magnetically connected with the respective roller and the two magnetic elements connected to the end portions of the latter, each of said shafts having two end sections axially spaced from each other, and each of said magnetic elements having one portion supported by the respective guide member and the other portion spaced from said supporting portion, said other portion of said magnetic element being provided with a pole shoe formed as a bearing for the respective end sections of the respective shaft.

4,234,077

EQUIPMENT FOR REMOVING BULK MATERIAL FROM A DUMP

Heinz Berthold, St. Ingbert-Rohrbach, and Karl E. Zimmer, Eiweiler, both of Fed. Rep. of Germany, assignors to Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft, Koln-Zollstock, Fed. Rep. of Germany

Filed Nov. 16, 1978, Ser. No. 961,094

Int. Cl.³ B65G *17/36*

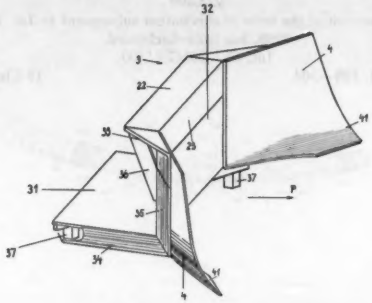
U.S. Cl. 198—712 **10 Claims**

1. A conveyor for removing bulk material from a base portion of an end face of a dump, comprising:

two horizontally spaced apart, parallel endless roller chains forming substantially horizontal upper and lower courses;

drive means for revolving said chains to move in a predetermined horizontal direction of travel along said lower courses; and

a plurality of adjacent carrying elements each comprising a frame which extends transversely between and is connected to each of said endless chains, and a bottom which extends substantially horizontally from the lower end of



said frame in the opposite direction to said predetermined direction of travel, said carrying elements being constructed and arranged to permit free passage of bulk material laterally into carrying spaces each defined by the frame of a first carrying element and the bottom of an adjacent carrying element

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4,234,078

CONVEYOR BELT DRIVE APPARATUS

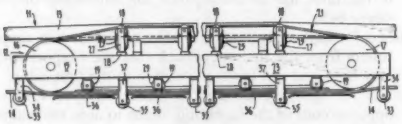
Frank J. Nott, 14 Garnet Leary Ave., Black Rock, Victoria, Australia

Filed May 25, 1978, Ser. No. 909,599

Claims priority, application Australia, Jun. 14, 1977, PD0432

Int. Cl.³ B65G *23/14*

U.S. Cl. 198—833 **9 Claims**



1. Conveyor belt drive apparatus comprising:

an endless flexible traction belt supported in an endless loop and formed of flat belting provided with

(a) longitudinal and transverse ribs standing out from the outer face of the belt and so as to define between them facial pockets occupying a major part of the outer facial area of the belt,

(b) a series of abutments disposed so that a plurality of said abutments stand out from the floor of each pocket, the outer surfaces of the abutments and the outer edge surfaces of the longitudinal and transverse ribs being substantially flush with one another throughout the length of the belt, and

(c) a series of openings spaced longitudinally of the belt and extending transversely through the belt from the inner face of the endless loop to communicate with said pockets;

traction belt drive means to drive traction belt around said endless loop; and

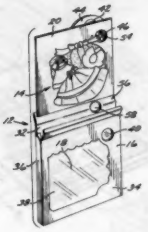
suction means to apply suction to the openings of the traction belt at the inner face of the traction belt as those openings transverse part of the loop whereby to create suction in the associated pockets.

4,234,079

PACKAGING FOR TOY ARTICLES AND THE LIKE

Michiko Otake, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1979, Ser. No. 51,004
Int. Cl.³ B65D *25/00*
U.S. Cl. 206—45.34 **2 Claims**



1. In combination a toy doll dress and a package for the toy doll dress, the package comprising:

a substantially flat support member to which the doll dress is fastened;

a packing member having an enclosure adapted to receive the support member and the doll dress, the packing member having a top panel including a transparent member for viewing the doll dress;

a display member rotatably mounted to the support member, the display member having a plurality of illustrations of a doll wearing the doll dress, and

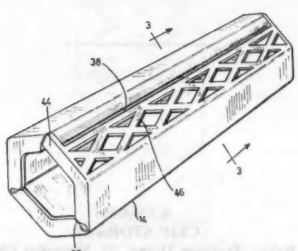
means for selectively exposing to view only a single illustration selected by a viewer at his option, the means including an aperture incorporated in the support member and a cut-away portion of the packing member, the display member being accessible in the cut-away portion for manipulation by a viewer, and the aperture being configured to expose for view only a single selected illustration.

4,234,080

COLLAPSIBLE CONTAINER

Jobst U. Gellert, 11 Newton Rd., Brampton, Ontario, Canada

Filed May 14, 1979, Ser. No. 38,671
Int. Cl.³ A45C *11/00*; B65D *11/20*
U.S. Cl. 206—0.82 **10 Claims**



1. A manually closable and openable elongated container having first and second ends for holding coins and the like thereinbetween comprising:

(a) a sheet of molded material having first and second parallel side edges and first and second end edges extending between said side edges in respective parallel planes extending substantially perpendicularly to said side edges, the sheet being divided into at least three segments by at least two hinge means running between the end edges of the sheet substantially parallel to the side edges, said segments having a V-shaped cross-section in the open position and the container has a regular polygonal cross-section in the closed position,

(b) releasable engagement means located along the first and second side edges for engaging the side edges when the sheet is bent about the at least two hinge means whereby a container in a releasably closed position is formed, and

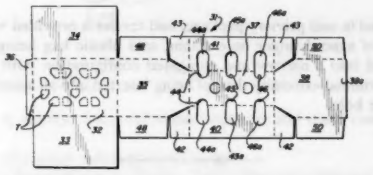
(c) ledge means extending inwardly from at least a portion of each of the first and second end edges to form at least partial covers over the ends of the container when in the closed position.

4,234,081

CARRIER FOR A PLURALITY OF ARTICLES

Charles L. Champlin, Rittman, Ohio, assignor to Packaging Corporation of America, Evanston, Ill.

Filed Apr. 30, 1979, Ser. No. 34,332
Int. Cl.³ B65D *75/04, 75/28*
U.S. Cl. 206—147 **19 Claims**



1. A carrier for foldable sheet material for accommodating a plurality of necked articles arranged in side-by-side relation to form at least one row, said carrier comprising an elongated base panel for subtending and supporting the row of accommodated articles and having opposed first peripheral portions and opposed second peripheral portions; end panels extending upwardly from said opposed first peripheral portions of said base panel, each end panel being positionable adjacent an end article of a row; an elongated top panel interconnecting the upper edge portions of the end panels and disposed in spaced substantially parallel relation with respect to said base panel, said top panel having spaced elongated peripheral portions with engaging means adapted to be in neck-engaging relation with the accommodated articles; upright elongated side panels extending upwardly a distance from said opposed second peripheral portions of said base panel for concealing substantial exterior portions of the accommodated articles, each side panel having an elongated upper edge spaced outwardly and downwardly from the neck-engaging peripheral portions of said top panel; means interconnecting adjacent edge portions of said end and side panels and affecting retention of said panels in predetermined upright angular relation; and a reinforcing member foldably connected to and depending from said top panel peripheral portions and being at least partially positioned under said top panel and intermediate said end panels, said reinforcing member coacting with said top and side panels to form elongated open side spaces for permitting selective axial removal of the articles from said carrier without permanent deformation to said top panel and said reinforcing member.

4,234,082

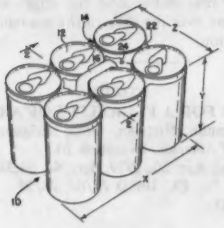
TWO-WAY CONTAINER PACKAGE

John R. Platt, Wheaton, and Edward L. Benno, Grayslake, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 19, 1979, Ser. No. 31,565
Int. Cl.³ B65D *77/00*
U.S. Cl. 206—150 **3 Claims**

1. In a carrier package for containers or the like which includes features permitting the formation of a secondary package of said containers when their contents have been removed, the combination of a plurality of containers and a carrier device retaining said containers in a primary package configuration relative to each other, a plastic bag having a

volume capacity not less than the total volume of said plurality of containers and of internal dimension sufficient to accept and retain all of said plurality of containers and to permit said bag to be closed with said plurality of containers retained therein, and said plastic bag in an empty collapsed condition releasably



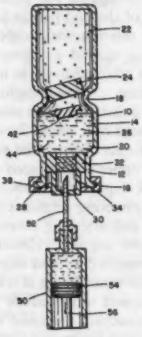
carried in said primary package, said carrier is provided with a pair of spaced finger hole means, said plastic bag being collapsed into a narrow and elongated configuration with each longitudinal extremity thereof being inserted into an associated finger hole.

4,234,083

MIXING AND FILTERING VIAL

Milton J. Cohen, 10823 Burbank Dr., Potomac, Md. 20854

Filed Nov. 13, 1979, Ser. No. 93,759
Int. Cl.³ B65D *25/08*
U.S. Cl. 206—221 **6 Claims**



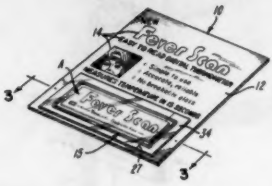
1. A device for packaging at least two materials which are to be maintained in a separated relation until admixed immediately prior to removal, one of the materials being in a liquid phase, comprising a vial open at one end and having an intermediate restricted portion, a sealing member secured in sealing relation across the restricted portion to sub-divide the vial into an upper compartment in communication with the open end and a lower compartment, with the material in the liquid phase disposed in the upper compartment and with the other material in the lower compartment, a tubular member open at the bottom and closed at the top, said tubular member into the open end portion of the vial to seal the vial with a portion of the tubular member projecting beyond the open end of the vial, a filter member disposed within the tubular member for filtering fluids passing through the tubular member, and a stopper seated in the open end of the tubular member.

4,234,084

COMBINED DISPLAY PACKAGE AND ARTICLE STORAGE CASE

James E. Hutten, Mason, Ohio, assignor to American Thermometer Co., Inc., Dayton, Ohio

Filed May 7, 1979, Ser. No. 36,573
Int. Cl.³ A61B *19/02*; B65D *25/22*, *75/36*, *75/58*
U.S. Cl. 206—306 **11 Claims**



1. A package system adapted for shipping and displaying an article and for providing a reusable storage case for the article, comprising a backing panel of card-like sheet material adapted to be printed, a first sheet of flexible material substantially smaller than said backing panel, a second sheet of flexible material substantially smaller than said backing panel, means connecting said first and second sheets to form a flexible case defining a pocket for receiving the article, at least one of said first and second sheets extending beyond said case and forming a border portion extending around said pocket, means for positively securing said border portion to said backing panel around said pocket, means defining a line of weakening extending around said pocket between said border portion and said means connecting said first and second sheets and providing for manually peeling said case from said border portion and said backing card after the package and article have been purchased, and means defining an opening within said case after said case is removed from said backing card to provide for conveniently removing and reinserting the article into said pocket.

4,234,085

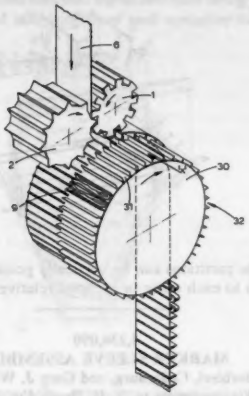
CLIP STORAGE

John D. Baker, Trafagar House, 11, Waterloo Place, London, England

Continuation of Ser. No. 795,919, May 11, 1977, abandoned.
This application Oct. 25, 1978, Ser. No. 954,345
Int. Cl.² F16B *2/20*
U.S. Cl. 206—337 **2 Claims**

1. A flexible carrier tape for resilient clips, said tape comprising a plurality of generally inverted V-shaped pleats extending transversely along the length of said tape and terminating at the edges thereof, and a respective clip on each one of said plurality of pleats, each of said clips comprising a generally U-shaped spring clip having transversely extending arms in facing relationship to each other and a bight portion connect-

ing said arms, each of said clips being positioned on a respective one of said pleats with the arms thereof extending along



opposite sides of said pleat and with said bight portion extending about an end edge of the associated pleat.

4,234,086

APPARATUS FOR HANDLING SOILED SURGICAL SPONGES

Howard E. Dorton, 108 E. Maxwell St., Lexington, Ky. 40508

Continuation-in-part of Ser. No. 31,839, Apr. 20, 1979, abandoned. This application Oct. 2, 1979, Ser. No. 81,172

Int. Cl.³ B65D *30/22, 33/02, 33/14, 85/00*

U.S. Cl. 206—362 **5 Claims**

1. In an apparatus for handling soiled surgical sponges comprising a plurality of flexible plastic bags arranged in a flat strip and having front and rear panels, open mouths at their tops, and closed bottoms and sides, the improvement which comprises three connections between the front and rear panels of each bag, the first connection being located in the central, lower region of the bag and being easily rupturable, and the other two connections being located in the upper region of the bag at opposite sides of the center of the bag.

4,234,087

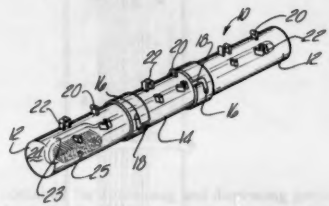
COMBINATION TOOTHBRUSH CARRIER AND HOLDER

Zoltan I. Pandak, 53054 Dryden, Utica, Mich. 48087

Filed Feb. 27, 1979, Ser. No. 15,715

Int. Cl.³ B65D *85/00*

U.S. Cl. 206—362.2 **11 Claims**



1. A combination toothbrush container and stand comprising:

an elongated housing comprising:

a first cylindrical tubular portion having a reduced outer diameter portion at one end; a first internal diameter portion at the opposite end; a central outer diameter and a central portion therebetween with a central cylindrical passage therethrough;

a second cylindrical tubular portion having one end with an internal diameter portion adapted to receive the reduced outer diameter portion of said one end of the first cylindrical tubular portion; an opposite end with a second internal diameter portion; a central outer diameter portion therebetween; and a central cylindrical passage therethrough such that said first and second cylindrical tubular portions are joined together by mounting said reduced outer diameter portion of said first cylindrical member into said internal diameter portion on said one end of the second cylindrical tubular portion to form said housing;

a first cap member mounted into said first internal diameter portion at said opposite end of the first cylindrical tubular portion such that said first cap member closes said opposite end of the central cylindrical passage of the first cylindrical tubular portion;

a second cap member mounted into said second internal diameter portion at said opposite end of the second cylindrical tubular portion such that said second cap member closes said opposite end of the central cylindrical passage of the second cylindrical tubular portion and thereby provide a closed container for housing a toothbrush;

a first coupling member mounted to the central outer diameter portion of one of said cylindrical tubular portions; and

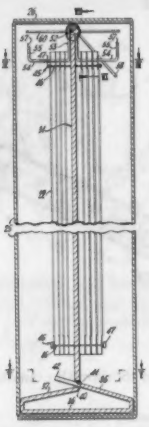
a second coupling member mounted to the central outer diameter portion of the other of said cylindrical tubular portions such that when it is desirous to utilize the toothbrush within said container said first and second cylindrical tubular portions of the housing are separated at said one end and said first coupling member is joined to said second coupling member, with said one end of each of said first and second cylindrical tubular portions oriented in an upright direction, thereby providing an upright stand to support the toothbrush to permit drying of the toothbrush in a free air stream after use.

4,234,088

FABRIC HANGER

Irving M. Berkowitz, 500 E. 85 St., New York, N.Y. 10028

Filed May 26, 1978, Ser. No. 909,905
Int. Cl.³ B65D *85/66*
U.S. Cl. 206—408 **24 Claims**



1. A fabric hanger for carrying piece length fabric in a pendant roll comprising a support assembly and a hanger assembly removably supported thereon, said hanger assembly having a center point;

said support assembly comprising a base portion, a substantially flat main body portion connected at one end thereof to said base portion and supported therefrom in an upstanding position, said main body portion having substantially longitudinally extending spaced apart edges forming a core for said roll of fabric and said edges being disposed opposite to each other a substantial distance from said hanger assembly center point means at an end of said main body portion opposite said base portion for removably supporting said hanger assembly;

said hanger assembly comprising a main support member, and means carried by said main support member from which fabric may be hung;

attachment means carried by said hanger assembly for supporting said main support member in generally horizontal disposition; and

anchoring means releaseably securing a selvedge of the fabric carried on said support assembly proximate the base portion of said support assembly.

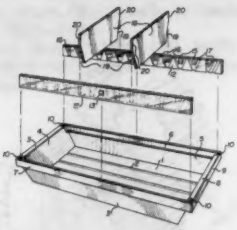
4,234,089

MICROFICHE TRAY

Royden B. Morris, 940 11th Ave. SW., Calgary, Alberta, Canada

Filed Jan. 25, 1979, Ser. No. 6,807
Claims priority, application Canada, Jan. 26, 1978, 295745
Int. Cl.³ B65D *85/48*
U.S. Cl. 206—456 **4 Claims**

1. A tray for microfiche cards or other flat articles comprising a bottom wall; side and end walls substantially at right angles to each other extending upwardly from said bottom wall, each of said side walls including a lower portion, an upper portion, and a substantially horizontal shoulder extending outwardly of said side wall at said upper portion, the tray being wider between said upper portions than between said lower portions of the side walls; a side bar for removable mounting on said shoulder on each side of the tray; retaining means for releasably retaining said side bars on said shoulder on each side of said tray; and a plurality of vertical and inclined slots on the interior surface of each side bar for receiving and retaining partitions extending between the sides of the tray,



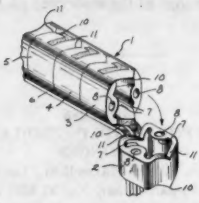
whereby the partitions can be vertically positioned in parallel relationship to each other or inclined relative to each other.

4,234,090

MARKER SLEEVE ASSEMBLY

Joseph C. Barbieri, Cedarburg, and Gary J. Wirth, Milwaukee, both of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Dec. 26, 1978, Ser. No. 972,662
Int. Cl.³ B65D *73/00*
U.S. Cl. 206—459 **2 Claims**



1. A marker sleeve assembly comprising:

(a) a plurality of individual marker sleeves each having an outer wall which defines a hollow generally tubular body which is to be positioned about an article; and

(b) a connecting member joined to the outer wall of each of the marker sleeves and extending longitudinally thereof, the connecting member being formed integrally with the marker sleeves,

(c) a longitudinally extending slit formed in the connecting member closely adjacent each marker sleeve, the slit extending partly through the connecting member, and

(d) each marker sleeve in the assembly being individually removable from the connecting member along the slit for application to an object while other marker sleeves in the assembly remain joined thereto.

4,234,091

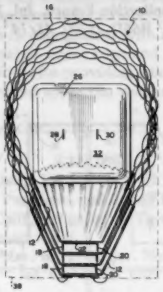
NESTED CONTAINER AND BASE CONNECTION

Roderic M. Koch, Evansville, Ind., assignor to George Koch Sons, Inc., Evansville, Ind.

Filed Oct. 10, 1978, Ser. No. 949,458
Int. Cl.³ B65D *21/02*; A01G *9/02*
U.S. Cl. 206—499 **3 Claims**

1. An upwardly opening container having a shape adaptable for stacking the container within containers of similar construction which includes a lower portion terminating with a centrally-located generally flat and horizontally extending bottom, a downwardly opening base having a shape adaptable for nesting a plurality of said bases within said container when unattached to said container which includes an upper portion terminating with a centrally-located generally flat and horizontally extending top upon which the container rests and a lower portion having an outer perimetral edge generally parallel to said horizontal top of said upper portion, said upper and lower

portions of said base being smoothly rounded for nesting, and means for connecting said container to said base with said bottom resting on said top, said top of said base being provided with apertures and said bottom of said container being pro-



vided with downwardly extending protrusions insertable through said apertures, the connecting means including said protrusions, said extending protrusions providing spacers for nesting said container.

4,234,092

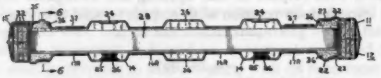
CONTAINER

Edwin Axel, 8707 Carlisle Rd., Wyndmoor, Pa. 19118

Filed Apr. 17, 1978, Ser. No. 897,770

Int. Cl.³ B65D *81/02, 85/30*

U.S. Cl. 206—523 **14 Claims**



1. A protective container for holding an object to be protected from damaging impact, comprising in combination,

(a) a hollow top section

(b) a hollow bottom section comprising a pair of colinearly spaced apart pan shaped end sections each having a base wall and end and side walls and at least one pan shaped central section colinear with said end sections, each end section being joined to said at least one central section by a generally U-shaped trough section, said at least one central section and trough sections each having a base wall and side walls and the pan sections walls being absent at the junctures with the trough sections so that said bottom section is open from one end wall to the other between the side walls, the base walls of at least said end sections being coplanar at a first level and the base walls of said trough sections being coplanar at a second and higher level, whereby when said bottom section is seated flatwise on an underlying surface there exists a vertical clearance between the surface and the base walls of said trough sections,

(c) shock absorbing means secured within said bottom section to which the object to be protected is securable in a free floating position,

(d) shock-absorbing end structures at opposite ends of and within said container positioned to closely face each end of the object to be protected, and

(e) means for fixedly securing said top and bottom sections together to form an enclosing protective shell.

4,234,093

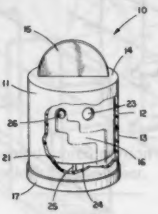
PILL DISPENSER WITH SAFETY FEATURES

Raymond K. Tyson, 406 N. Carr Rd., Plainfield, Ind. 46168

Filed May 21, 1979, Ser. No. 40,896

Int. Cl.³ B65D *83/04, 85/56*

U.S. Cl. 206—536 **10 Claims**



1. A safety container for containing and dispensing particulate matter such as pills and the like, said container comprising:

(a) An exterior member including an end wall, and including a cylindrical side wall defining an exterior side wall aperture;

(b) an interior member including a cylindrical side wall defining an interior side wall aperture, the cylindrical side wall of said interior member being concentric with an slidably engaged in both a longitudinal and a transverse direction with the cylindrical side wall of said exterior member such that said two apertures can be registered with each other, said interior member further including an end wall which is oppositely disposed to the end wall of said exterior member;

(c) grasping means for slidably moving said interior member with respect to said exterior member, said grasping means including a first projection from the end wall of said interior member, and a second projection from the end wall of said exterior member;

(d) means for preventing said container from being set down when said two apertures are in registration, said means including said first projection being dimensioned such that the placement of said container on a flat horizontal surface, with said container resting upon said first projection and said exterior member, is prevented without said container tipping over, said means further including said second projection extending beyond the side wall of said exterior member when said apertures are in registration, to prevent, in combination with said first projection, said container from being placed in an upright position upon a flat horizontal surface without said container tipping over; and

(e) in which said interior member is slidably movable to a fully closed position in which said second projection is fully contained within a recess defined by said side wall of said exterior member.

4,234,094

GRIDWORKS STORAGE SYSTEM

Carsten Jorgensen, Koge, Denmark, assignor to Copco, Inc., New York, N.Y.

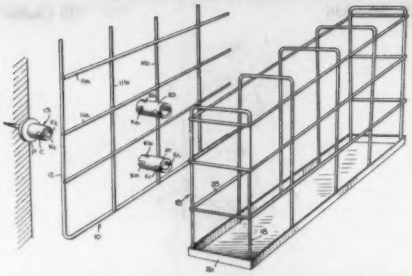
Filed Feb. 27, 1979, Ser. No. 15,581

Int. Cl.³ A47F *5/01, 5/08*

U.S. Cl. 211—88 **9 Claims**

1. A gridworks storage system for a kitchen or other area requiring a wall-mounted storage facility for utensils and other items, the system including at least one grid module formed by a network of intersecting round wires, and a set of brackets to attach said module to a wall, each bracket having a pedestal which lies against the wall and a hollow column formed of resilient material projecting outwardly from the pedestal, said pedestal having a central bore therein to receive a mounting screw or anchor bolt for insertion in the wall, said column

having a split head to define a pair of diametrically-opposed key-hole slots whose inlets have a normal width smaller than the diameter of said wires and whose circular sockets have a



diameter substantially matching the wire diameter, the inlets being dilatable to permit a grid wire at an attachment point to be forced into and locked within said slots.

4,234,095

COLLECTION CONTAINER FOR STERILE LIQUIDS

Albert Safianoff, Rancho Palos Verdes, Calif., assignor to Alpha Therapeutic Corporation, South Pasadena, Calif.

Filed Feb. 21, 1979, Ser. No. 13,446
Int. Cl.³ B65D *41/20*
U.S. Cl. 215—232 **14 Claims**

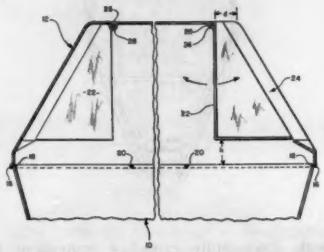
1. A collection container for sterile liquids comprising:
an elongated tapering hollow body of clear thermoplastic material, having a neck portion at an upper end, said neck portion terminating in an opening into the container;
a flat disc-shaped closure fixedly locked to the opening with a sterile liquid tight connection to maintain the interior of the container sterile, said closure having at least one hollow sleeve depending therefrom and extending interiorly of the neck portion for receiving and securely mounting a hollow tube inserted therein to conduct liquid to the interior of the container,
a permanent puncturable seal closing the hollow sleeve at the point of juncture of the sleeve and the closure, and;
filtered venting means formed into the closure communicating between the interior and exterior of the container.

4,234,096

COVER FOR WASTE CONTAINER

Claude Hergaux, 6 & 8 Rue de l'Avenir, 76120 LeGrand Quevilly, France

Filed May 7, 1979, Ser. No. 36,581
Claims priority, application France, Jul. 24, 1978, 78 22065
Int. Cl.³ B65D *23/00, 43/14, 51/04*
U.S. Cl. 220—1 T **5 Claims**



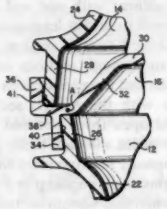
1. A cover for a storage and transport container of waste material, comprising a body having a truncated pyramidal shape provided with a center of symmetry and a pair of perpendicular axes of symmetry passing through said center, said body being closed on its top and open at its base, the base being square, at least one side of said body being provided with an opening for introduction of waste, a door mounted within said opening, said door being formed as an L-shaped member, the long leg of which is pivotably secured at its free end to the top of said body and the short leg of which extends outwardly of said opening, said L-shaped member having a center of gravity acting to maintain said longer leg vertical in the absence of a load thereon, whereby said door is biased in normally closed position with respect to said opening and swingable under a load into an open position with respect to said opening.

4,234,097

SERVING PLATE SET OR THE LIKE

Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation of Ser. No. 733,563, Oct. 18, 1976, abandoned.
This application Dec. 10, 1979, Ser. No. 102,060
Int. Cl.³ B65D *21/02, 1/26, 43/08*
U.S. Cl. 220—4 D **1 Claim**



1. A plate set comprising a first plate having a bottom wall and upstanding peripheral walls terminating at an upper edge, a seal plate having a top wall and integral downwardly extending peripheral walls terminating at a lower edge, a flange integral with and extending outwardly from said lower edge, a first rim wall integral with and extending downwardly from said flange, and a second rim wall integral with and extending upwardly from said flange, and slightly offset from said first rim wall, said upper edge having an outer diameter greater than an inner diameter of an inner face of said first rim wall, the

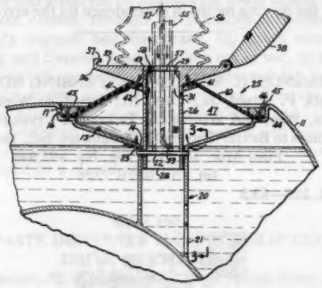
upper edge of the first plate being engaged in a liquid tight seal against the inner face of said first rim wall, said first plate and said seal plate being separable from each other and adapted to container consumables when the first plate and the seal plate are sealed together and a second plate having a bottom wall and upstanding peripheral walls terminating at a second upper edge which edge is in engagement with an inner face of said second rim said engaged upper edge and inner face providing a bending moment force for providing a liquid seal between the inner face of said second upper rim wall and said second upper edge.

4,234,098

FUEL TANK FILL PORT EXTENSION

Charles G. Miller, Pasadena, and James B. Stephens, La Crescenta, both of Calif., assignors to Yamaha Motor Corporation, U.S.A., Cypress, Calif.

Filed Mar. 15, 1979, Ser. No. 20,715
Int. Cl.³ B65B *3/00*
U.S. Cl. 220—86 R **19 Claims**



1. In combination: a fuel tank having a wall and a fill port through said wall; and an extension comprising a tube having an axis, an innermost end, and an outermost end, said tube being axially movable in said fill port, with its innermost end inside the fuel tank, its outermost end outside the fuel tank and adapted to be closed by a closure, and a peripheral flexible diaphragm having an inner and an outer periphery, said diaphragm being imperforate between said peripheries, the outer periphery being sealingly attached to said wall, the inner periphery being sealingly attached to said tube adjacent to its outermost end, whereby to make a fluid sealing barrier between said tank and said tube to prevent escape of fluid from said fill port except through said tube, said diaphragm being constructed so as to flex to enable the tube to move axially from a retracted to an extended position relative to said fill port.

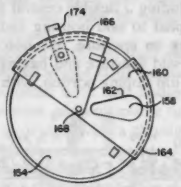
4,234,099

CONTAINER WITH ATTACHED PULL TAB OPENING

Richard E. Tarro, 425 Broadway, Providence, R.I. 02909

Continuation-in-part of Ser. No. 422,265, Dec. 6, 1973, abandoned, and a continuation-in-part of Ser. No. 603,590, Aug. 11, 1975, Pat. No. 4,008,823. This application Sep. 7, 1978, Ser. No. 940,354
Int. Cl.³ B65D *41/32*
U.S. Cl. 220—269 **18 Claims**

1. A pull tab opener device for a container having a metal top comprising a scored portion outlining the opening of a generally oval shape aligning axially with a radius of the top, a pull tab attached to said scored portion adjacent the outer end thereof, means for pivotally attaching said scored portion to the top including a plastic strip having one end pivotally attached to the container top, the other end of said strip being bonded to the inner end of said scored portion, and means for returning said scored portion into the container opening to reclose the opening, said means comprising a thick portion at said scored portion formed by the thickness of said metal and



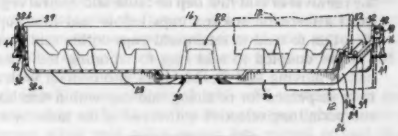
of said plastic to allow said scored portion to be snapped back into the opening to reclose the container.

4,234,100

CONTAINER LID HAVING VENTING MEANS

Jean-Marie Chabot, St. Damien Bellechasse, Canada, assignor to Les Industries Procinciales Ltee, St. Damien Bellechasse, Canada

Filed Jun. 8, 1979, Ser. No. 46,720
Claims priority, application Canada, May 25, 1979, 328350
Int. Cl.³ B65D *41/16, 43/06, 55/00*
U.S. Cl. 220—306 **8 Claims**



1. A container lid for packaging principally air contaminative products comprising: a generally circular body having a main central portion and a downwardly extending peripheral lip portion adapted to snap over and engage the top rim portion of a container in sealed relationship; said main central portion including a top face and an underface, and terminating at the periphery thereof with an upstanding side wall contiguous with said lip portion, said side wall including an upper peripheral portion inwardly spaced from and defining with said lip portion a rim-receiving portion for said container; said side wall having a lower peripheral portion provided with a series of radially inward and circumferentially spaced cavities opening in said underface so that air and fluid filling said container may be expelled from said container even after said lower peripheral portion has come into engagement with the rim portion of said container; as said container lid is further pressed down into said container, the upper peripheral portion of said side wall sealingly engages the rim portion of said container.

4,234,101

CUP DISPENSER EMPLOYING UNIVERSAL ADJUSTMENT APPARATUS

Ronald Pastore, Bedford, N.Y., assignor to Cal Pak Industries, Inc., Stanford, Conn.

Filed Jul. 13, 1979, Ser. No. 57,351
Int. Cl.³ A47F *1/06*
U.S. Cl. 221—241 **9 Claims**

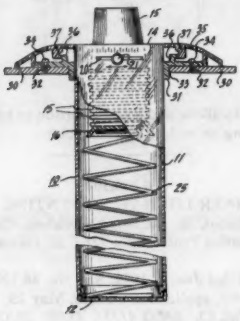
1. A cup dispenser apparatus employing universal adjustment means, comprising:

(a) a longitudinal tubular housing capable of accommodating a stack of cups to be dispensed,

(b) a rotatable cam ring coupled within the hollow of said housing, said ring having a plurality of cam surfaces about the periphery,

(c) a plurality of flexible arms having a first end coupled to

said housing on said internal wall and a second end coacting with one associated cam surface on one side and for coacting with a cup surface on said opposite side, each of said arms including a flexible central portion having said first end coupled to said housing and a second end top portion having an aperture, an elastomeric member secured within said aperture and having a first central flat region with a top sloping portion, with said central region



of said member adapted to coact with a plurality of said cups in said stack, with said sloped portion responsive to the removal of said first cup to cause said central region to exert a force on stacked cups below said first cup in a direction to tend to retain said cups within said housing,

(d) means coupled to said ring for rotating the same and hence, moving said flexible arms into contact with a cup to be dispensed for retaining said cup within said housing and permitting selective withdrawl of the same by a user.

4,234,102

APPARATUS FOR MEASURING AND DISPENSING CONSTANT WEIGHT PORTIONS OF MATERIAL

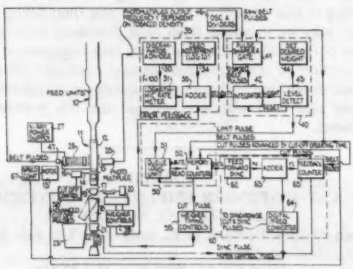
Peter J. C. Spurgeon, Andover, England, assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 22, 1979, Ser. No. 969,605

Claims priority, application United Kingdom, Dec. 16, 1977, 52462/77

Int. Cl.³ B67D *5/08*

U.S. Cl. 222—55 **11 Claims**



1. Apparatus for dispensing material in portions of predetermined weight from a stream of said material of irregular density, comprising:

feed means for feeding material through a measuring region;

variable speed driving means coupled to said feed means;

density determining means for continuously measuring the density of material passing through said measuring region;

speed control means for controlling the speed of said driving means to compensate for variation in the measured density of the material to provide discharge of the portions of predetermined weight from said feed means at regulatly spaced time intervals;

signal generator means for producing a signal representing the speed of travel of said feed means; weight determining means for producing a signal indicative of weight in dependence on the outputs of the density determining means and the speed signal generator means; comparator means for comparing the weight of the portions to provide a position signal representing the position of separation of said portions; separator means positioned adjacent the discharge end of said measuring region for effecting separation of said portions in sequence as they arrive at the separation position; and delay means for producing a delayed output under the control of the position signal to actuate said separation means at the moment the appropriate portion arrives at the separation position;

said speed control means including an error detector for determining ay time error between the actuation of said separator means and the presence of receiving means at the measuring region to provide additional speed control of the driving means in dependence on the error detected.

4,234,103

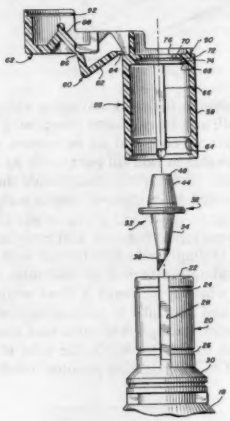
DIAGNOSTIC REAGENT DISPENSING BOTTLE

Frederick P. Strobl, Jr., Cary, Ill.; David A. Winchell, Twin Lakes, Wis., and William A. DeVroom, Crystal Lake, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 31, 1978, Ser. No. 892,346

Int. Cl.³ B67B *7/26*

U.S. Cl. 222—83.5 **1 Claim**



1. A dispensing bottle for accurately and controllably dispensing droplets of a liquid, said dispensing bottle comprising:

(a) a container for holding the liquid which has a flexible containing base portion and an elongated neck extending from said base portion, said neck having a top wall which includes a piercable membrane, and said neck also having cap-positioning-and-guiding means associated therewith, which means includes upper detent means positioned adjacent the top wall of the neck and lower detent means positioned between the base portion and said upper detent means;

(b) spike means having a lower section for piercing said membrane, an upper section which defines a nozzle for accurately and controllably dispensing of droplets of liquid, the nozzle having a conical surface defining an included angle between about 70°–85°, and a fluid passage extending between the upper and lower sections of said

spike means, so as to permit liquid flow from said container to said nozzle; and

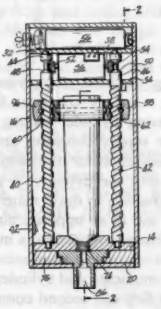
(c) a cap, which is a separate member from said spike means but carrying said spike means and having (1) a body portion which includes cap-positioning-and-guiding means for cooperation with said cap-positioning-and-guiding means on said neck, in positioning spike means relative to said piercable membrane and for releasably positioning said spike means in a non-piercing shipment position and securely positioning said spike means in a piercing dispensing position, said positioning-and-guiding means on the neck including a pair of diametrically opposed and longitudinally extending guide slots in the surface thereof and the positioning-and-guiding means on the cap including a pair of longitudinally extending guide ribs adapted for sliding cooperation with said guide slots to guide the cap substantially longitudinally as said cap is thrust downwardly, said cap-positioning-and-guiding means of said cap body portion including a single detent engaging rib for cooperation with both said upper and lower detent means so that when the rib engages the upper detent means, the spike is positioned in the non-piercing shipment position and when the rib engages the lower detent means, the spike extends through the piercable membrane and sealingly engages said membrane, (2) cover means for closing said dispensing bottle when not in use, said cover means including sealing means constructed for insertion into said nozzle to prevent dispensing of liquid therethrough when said cover means is closed, and (3) hinge means associated with said body portion and said cover means for selectively maintaining said cover means either in an open or a closed position.

4,234,104

TOOTHPASTE DISPENSER HAVING A SLIP CLUTCH DRIVE MECHANISM

Louis J. Apuzzo, Jr., 52 Fairfield St., New Haven, Conn. 06515, and Frank Acquarulo, Jr., 87 Lenox St., East Haven, Conn. 06512

Filed Jun. 2, 1978, Ser. No. 911,816
Int. Cl.³ B65D *35/28*
U.S. Cl. 222—94 **2 Claims**



1. An apparatus for dispensing toothpaste from a collapsible toothpaste tube onto a toothbrush which comprises:

a housing;

battery powered motor means located within said housing;

means for powering said motor means located within said housing;

output shaft means directly associated with said motor means;

threaded shaft means positioned within said housing;

coupling means directly associated with and integral with said motor output shaft means and said threaded shaft means so as to rotate said threaded shaft means upon rotation of said output shaft means, said coupling means comprising a wheel means on said output shaft means which frictionally engages groove means on said threaded shaft means so as to drive said threaded shaft means and allow for slipping between said wheel means and said groove means in the event of excessive load on said threaded shaft means;

roller means associated with said shaft means so as to move on said shaft means as said shaft means rotates;

outlet means associated with said housing through which said toothpaste from said collapsible tube is expelled;

closure member provided with a through bore positioned beneath said outlet means and reciprocally movable across said outlet means between a first position where said outlet is closed to a second position where said through bore communicates with said outlet means so that said outlet is opened, said closure member further including an extension which lies in a plane substantially perpendicular to the axis of movement of said closure member, said extension being provided with a recess;

first switch means associated with said motor means for actuating said motor means by said power means so as to rotate said shaft means;

a toothbrush received in said recess for moving said closure member from said first position to said second position wherein said closure member directly engages said first switch means so as to actuate said motor means such that said roller means moves on said shaft means and said toothpaste is applied to said toothbrush;

second switch means associated with said motor means for reversing the polarity of said motor means so as to selectively rotate said shaft means in a clockwise and counterclockwise manner upon actuation of said motor means such that said roller means moves in a first direction and a second direction on said shaft means;

third switch means associated with said power means and actuated by said roller means for actuating light indicating means when said roller means has moved in said first direction so as to completely dispense the contents of said collapsible tube; and

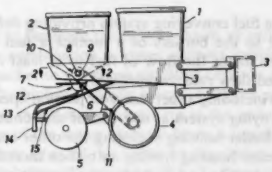
further including a baffle wall positioned above said closure member and defining with said housing a chamber in which said closure member reciprocates, said through bore prevents accumulation of toothpaste in said chamber, said baffle wall being provided with a dish-shaped indentation for supporting said toothpaste tube.

4,234,105

HOPPER AND FEED WHEEL ASSEMBLY FOR A FERTILIZER SPREADER

Jose A. Viramontes, Mesilla Park, N. Mex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 23, 1979, Ser. No. 59,806
Int. Cl.³ G01F *11/20*
U.S. Cl. 222—233 **4 Claims**



1. A hopper and feed wheel assembly for a fertilizer and/or pesticide spreader comprising:

(a) an open-topped hopper having a tapered bottom which is equipped with a bottom discharge opening at its lower most point, said discharge opening being closeable or adjustable in any size by means of a movable plate which is located below and is affixed to the hopper bottom and

which moves over the discharge opening in accordance with calibrated settings;

(b) a horizontally disposed feed wheel made up of a rotatable shaft traversing the width of the hopper and having its longitudinal axis directly above the bottom discharge opening, a longer smaller diameter rod is attached at its ends to the outside peripheral surface of the shaft inside the hopper and said rod extends outward from the peripheral surface of the shaft at the attached ends and is bent back in a direction substantially parallel to the longitudinal axis of the shaft in a series of rod lengths which substantially traverse the length of the shaft inside the hopper, each of said rod lengths being joined endwise to the next adjacent rod length by a series of reverse bends extending substantially around the pheripery of the shaft, each of said rod lengths traversing the longitudinal axis of the shaft being further bent at various points along the length such that a series of protuberances are formed on each of said rod lengths with the combined number and positioning of the protuberances on all of the rod lengths being such that all points along the rod lengths at a maximum distance from the shaft as defined by apexes of the protuberances are contacted; the rotatable shaft being positioned in the hopper so that the apexes of the rod protuberances closely approach the bottom of the hopper as defined by the bottom discharge opening when the shaft is rotated;

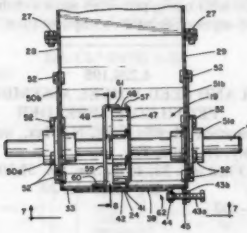
(c) a means for holding the feed wheel in position in the hopper and for imparting rotation on the shaft of the feed wheel.

4,234,106

FUEL DELIVERY SYSTEM FOR A FURNACE OR KILN

Donald E. Rywak, New Kensington; James L. Griffith, Pittsburgh; Frederick D. Rhodes, Saxonburg, and Otto Kovalsics, Pittsburgh, all of Pa., assignors to Pullman Incorporated, Chicago, Ill.

Filed Dec. 1, 1978, Ser. No. 965,627
Int. Cl.³ G01F *11/24*
U.S. Cl. 222—239 **19 Claims**



1. For a fuel conveying system providing delivery of particulate fuel to the burners of a furnace a fuel flow regulator adapted to meter the flow of fuel to at least one burner at a preselected flow rate, comprising:

a chute including a fuel reservoir portion opening to said fuel conveying system at one end of said chute and having a fuel feeder housing enclosing the other end of said chute,

said feeder housing having an orifice therethrough accommodating flow of fuel from the reservoir into the burner,

drive shaft means extending into said feeder housing and being supported thereby,

flow metering means carried by said drive shaft means within the housing and including portions radially extending from said drive shaft means defining fuel metering chambers generally aligned above the breadth of said orifice,

said flow metering means further including a plurality of radially extending blade members extending from said drive shaft means adjacent said fuel metering chambers,

feed rotor means mounted on said drive shaft means within said housing, and,

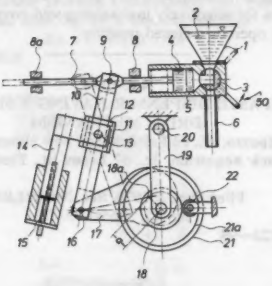
said feed rotor means and said blade members being operatively reactive upon rotation of said drive shaft means to direct particulate fuel towards said metering chambers in said housing and through the orifice into the burner at a preselected rate of fuel commensurate with burner heating requirements.

4,234,107

TUBE FILLING MACHINE HAVING AN ADJUSTABLE STROKE, CAM OPERATED PISTON

Hermann Gernlein, Karlsruhe, Fed. Rep. of Germany, assignor to Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Filed May 23, 1979, Ser. No. 41,737
Claims priority, application Fed. Rep. of Germany, May 31, 1978, 7816308[U]
Int. Cl.³ G01F *11/06*
U.S. Cl. 222—309 **2 Claims**



1. A packaging machine, comprising, a material feeding device, including a supply container for the material to be packaged, a metering cylinder having one end with a first connection to the supply container and a filling nozzle discharge second connection for discharging the material which has been drawn into the cylinder, a piston slidable in said cylinder in one direction to draw material from the container into the cylinder and in an opposite direction to discharge it through said discharge connection, a mechanically adjustable valve located between said first and second connections which is shiftable to communicate said cylinder selectively and alternatively with said first and second connections, a crank shaft, a cam plate affixed to said crank shaft for rotation therewith, an arm having one end secured at a fixed location and an opposite end rotatably supporting said crank shaft, a fixed position roller mounted alongside said cam plate in operative engagement therewith, a connecting rod having one end pivotally mounted on said plate at a spaced location from a central axis of said plate and having an opposite end, a link having one end connected to said connecting rod and an opposite end connected to a piston rod connected to the piston, a pivot bearing bushing slidable on said link, a displaceable bearing block having a part pivoted on said link and an opposite end part, and an adjustment means connected to said opposite end part of said bearing block being adjustable to vary the stroke of said piston.

4,234,108

PISTON FOR AEROSOL CONTAINER

George B. Diamond, Anthony & Woodglen Rds., R.D., Glen Gardner, N.J. 08826

Filed Nov. 25, 1977, Ser. No. 854,487
Int. Cl.[3] B67D 5/54
U.S. Cl. 222—386 19 Claims

1. A barrier piston for an aerosol dispensing container, comprising:

a piston head constructed to sealingly separate the aerosol container into two chambers on opposite sides of said piston; said piston head having an annular support thereabout;

an annular cylindrical collar, having a bottom end that is sealingly attached to said piston annular support; said collar extending up from said piston annular support to a top end of said collar; said collar having an inner surface that is spaced from said piston head, such that said collar may flex without engaging said piston head;

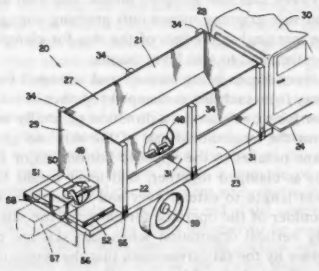
an annular flange sealingly attached to said collar top end and extending up from said collar; said collar being relatively more flexible than said flange; said flange being frusto-conically shaped, flaring outwardly, upwardly from the junction of said flange and said collar at said collar top end to a free end of said flange.

4,234,109

MATERIAL-DISPENSING IMPLEMENT

Robert D. Goodhart, 115 E. Kruzan, Brazil, Ind. 47834

Filed Jun. 17, 1977, Ser. No. 807,357
Int. Cl.[3] A01C 15/16, 23/00
U.S. Cl. 222—609 16 Claims



1. A material-dispensing implement mountable to a vehicle for distributing dry material when said implement is in a first configuration and liquid when in a second configuration, said implement being repeatedly changeable from one configuration to the other configuration, said material-dispensing implement comprising:

a frame mountable to said vehicle;

an open vessel attachable to said frame for holding dry material in one configuration and liquid in the other configuration;

mean for conveying dry material from within said vessel to a remote location when said implement is in said dry material configuration; and

means for changing said material-dispensing implement from one configuration to the other configuration, said changing means comprising:

(a) a shroud positioned within said vessel and above a portion of said conveying means;

(b) a plurality of gasket members attachable to the periphery of said shroud;

(c) a plurality of adjustable clamping devices attached to said vessel and to said shroud; and

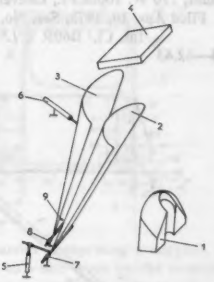
(d) means for securing the periphery of said shroud; with gasket members attached, against the interior surface of said vessel to make sealing contact therewith.

4,234,110

DEVICE FOR FOLDING-DOWN AND PRESSING JACKET COLLARS

André Zachringer, Strasbourg-Meinau, France, assignor to Vestra-Union, S.A., Paris, France

Filed Oct. 17, 1978, Ser. No. 952,253
Claims priority, application France, Oct. 17, 1977, 77 31871
Int. Cl.[3] D06C 15/02
U.S. Cl. 223—57 5 Claims



1. A device to facilitate the folding-down of jacket collars, comprising in combination a lower support member (1) for supporting a jacket to which an unfolded collar is attached, a lower plate (2) which is pivotally mounted (7) and controllable by a jack (5) so that it swings down on to the jacket and then the upper edge of the lower plate (2) forms a template against which the lower edge of the collar on the jacket can be located, an upper plate (3) which is pivotally mounted (8) and controllable by a jack (6) so that it swings down and lies against the lower plate (3) and a portion of the upper plate (3) projects above the upper edge of the lower plate (2), the upper edge of the upper plate (3) then forming a template for a fold line of the collar which is located by the lower plate (3), and a pressing or ironing upper member (4) movable to press or iron the said collar after the latter is folded down over the upper plate (3).

4,234,111
DEVICE FOR THREADING STRINGS OR THE LIKE

Gebhard Dischinger, Josefstrasse 33, 7710 Donaueschingen, Fed. Rep. of Germany

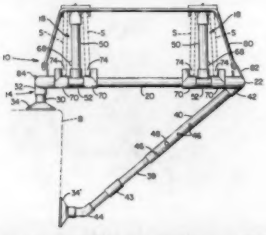
Filed Jul. 28, 1978, Ser. No. 928,912
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1977, 2734441
Int. Cl.[2] D05B *85/00*
U.S. Cl. 223—104 19 Claims

1. Device for threading strings or the like in a through bore of an anchoring part, frame, or the like, characterized by a handle (**10, 80, 82**), a tube (**14**) connected to the handle, the inside diameter of said tube matching the outside diameter of the string (**50**) to be threaded with play, and by a stylet (**12, 56**) with a tapered rounded tip (**29,58**), said stylet being insertable in the tube (**14**) in such manner that it partially fills the tube and partially projects beyond the forward end (**34, 64**) of the tube.

4,234,112
WATER SKI RACK

Guy G. Gallant, 770 W. 100th Pl., Denver, Colo. 80221

Filed Apr. 10, 1978, Ser. No. 894,938
Int. Cl.[3] B60R *9/12*
U.S. Cl. 224—42.43 14 Claims



1. A ski rack adaptable for mounting on the horizontal top and vertical side external surfaces of a boat and the like comprising:

a frame;

rack securing means extending from said frame including a pair of relatively short, fixed leg support members and a pair of relatively long, telescopically and angularly adjustable leg support members thereon, each of said leg support members having releasable attachment means at its free end for releasably securing said fixed leg support members to said horizontal top surface and said angularly adjustable leg members to said vertical side surface of said boat; and

a ski mount assembly including ski support means adapted to releasably retain the intermediate portions of a pair of skis in edgewise, substantially parallel relation to one another, said ski support means including an upstanding post on said frame, a spring-loaded, enlarged head at one end of said post opposite to said frame, said head having guide channels along the side of said mounting post in facing relation to said frame, each adapted to receive a side edge of a ski and said head being spring-loaded in a direction urging it toward said mounting frame, and a pair of adjustable stop members on said frame in spaced relation to said ski support means, said adjustable stop members being movable into engagement with oppositely facing surfaces of said skis whereby to cooperate with said ski support means in releasably retaining a pair of skis on said rack.

4,234,113
MANUAL SKI CARRIER

Francois J. Nalvarian, 7699 Squirewood Way, San Jose, Calif. 95129

Filed Nov. 20, 1978, Ser. No. 962,380
Int. Cl.[2] A63C *11/02*
U.S. Cl. 224—45 S 8 Claims

1. In a ski carrier for carrying of a pair of skis manually:

main body means for extending laterally of a pair of skis to be carried in parallel bottom-to-bottom facing relation;

side gripping means carried from said main body means for gripping opposite side marginal edges of the skis as the skis are positioned in said parallel relation;

cam means pivotably coupled to said main body means and operatively associated with said side gripping means for operation of said side gripping means for effecting opening and closing of said side gripping means in accordance with pivotable operation of said cam means;

lever means operatively associated with said cam means for effecting operation of said cam means;

said cam means being operatively associated with said side gripping means so that when said lever means is pivoted away from the skis, as positioned in carrying position between said side gripping means, said cam means forces said side gripping means into gripping engagement with the marginal side edges of the skis for clamping the skis together and to said lever means;

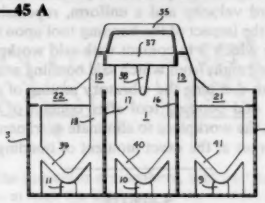
said lever means being formed and arranged for extending away from said skis as clamped together in bottom-to-bottom facing relation in a direction generally orthogonally from the longitudinal axis of the skis and generally in a plane parallel to the opposed bottom major faces of said skis as clamped together, said lever means having sufficient length to extend over and to be received over the shoulder of the operator for carrying the skis in a generally vertical orientation when said skis are clamped together by the ski carrier such that the center of gravity of the clamped skis falls generally in a position vertically below the point of engagement of said lever means with the shoulder of the operator.

4,234,114

ARTICLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 9, 1979, Ser. No. 10,817
Int. Cl.³ B65D *71/00*
U.S. Cl. 224—45 A **6 Claims**



1. An article carrier comprising bottom structure **(23–34)**, a pair of side walls **(1,6)** integrally joined respectively to the sides of said bottom structure and extending upwardly therefrom, a pair of end walls **(2,3)** integrally joined respectively to the ends of said bottom structure and extending upwardly therefrom, the ends of said side walls being integrally joined respectively to the adjacent ends of said end walls, transverse partition structure **(14–17)** integrally joined to said side walls and extending therebetween, longitudinal partition structure **(18,19)** integrally joined to said end walls and extending therebetween, said longitudinal partition structure being integrally joined to said transverse partition structure to form multiple article receiving cells, handle structure **(35)** disposed in vertical alignment with said longitudinal partition structure and extending upwardly therefrom, a handle receiving pocket **(20)** defined by said longitudinal partition structure, the transverse width of each of said article receiving cells adjacent said bottom structure being less than the diameter of the corresponding article to be packaged, and characterized by a pair of support strips **(36,37)** being disposed at the base of said handle structure generally parallel to said side walls and offset from the longitudinal medial line of the carrier, a separation tab **(38)** being joined to one of said support strips and extending downwardly therefrom, the bottom portion of said separation tab being yieldable, and a V-shaped separation element **(39–41)** being disposed between adjacent portions of said longitudinal partition structure associated with one of said article receiving cells and the midportion thereof being yieldable.

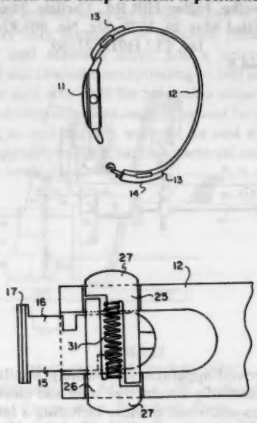
4,234,115

WATCH BAND ASSEMBLY

Bill D. Williams, 702 Marion Dr., Madison, Ala. 35758

Filed May 25, 1979, Ser. No. 42,437
Int. Cl.³ A44C *5/00*
U.S. Cl. 224—168 **5 Claims**

1. A resilient watch band, the ends of which can be attached or detached from a respective pin member attached to a watch body without removing the pin member from attachment to the watch body, the watch band including identical latching mechanisms at each end thereof, each latching mechanism including a clasp element having an elongated body portion and a head portion, the head portion being capable of wrapping around a watch body pin member and the body portion of the clasp element being slidable within a longitudinal groove in the end of the watch band so as to allow its head portion to be positioned at a varying distance from the end of the watch band; at least one release button which is capable of either locking the position of said clasp element such that said head portion is at its closest distance from the end of the watch band or when pressed can allow the clasp member to be manually moved along said groove such that the head portion will be at its furthest distance from the end of the watch band; and a cover element which is capable of covering most of said clasp element and each release button, said cover element including an extension flange which extends sufficiently beyond the end of said watch band to lock a pin member in said clasp element head portion when said clasp element is positioned within said



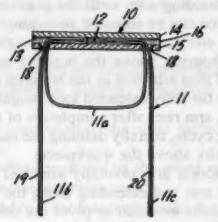
groove that its head portion is at its closest distance to the end of said watch band.

4,234,116

ADJUSTABLE CARRIER

Daniel J. Myers, 89-15 92nd St., Woodhaven, N.Y. 11421

Filed Apr. 13, 1979, Ser. No. 29,668
Int. Cl.³ A45F *5/02*
U.S. Cl. 224—250 **4 Claims**



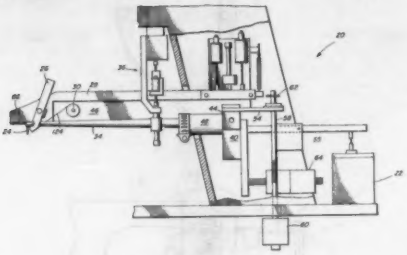
1. An adjustable carrier comprising a support, means for mounting the support to a belt worn by the wearer, said support including a portion exterior to the outer surface of the belt worn by the wearer, an elongated band adjustably coupled with the exterior portion of the support, a pair of vertically extending band-engaging members carried by the support exterior to the outer surface of the belt and around which portions intermediate the free ends of the band are threaded to form an adjustable intermediate span of the band between the members which cooperates with the exterior portion of the support to accommodate an article adjacent said exterior portion and which can be securely held and the span adjusted by tightening the intermediate span with the application of force to the ends of the band, vertically extending slots in the exterior portion of the support and communicating with said pair of vertically extending band-engaging members on opposite sides thereof so that the band can be threaded through the slots and around band-engaging members on opposite sides of the intermediate span of the band, and means for securing the free ends of the bands together to maintain the article in the carrier.

4,234,117

VIBRATION-FREE TAILLESS WIRE BONDER

Richard F. Foulke, Indian Hill Rd., Carlisle, Mass. 01741

Filed May 26, 1978, Ser. No. 909,824
Int. Cl.³ H01L *21/60*
U.S. Cl. 228—4.5 **11 Claims**



1. An improved apparatus for forming a tailless bond between fine electrically conductive wire and electrical contact points of micro-electronic devices including a housing, means to bond the wire to the work piece and a switching mechanism for initiating and sequencing said bonding cycle, wherein the improvement comprises;

a horizontally extending bonding arm pivotally mounted on said housing and supporting said bonding tool for vertical motion;

an electro-mechanical Z-drive linear actuator extending between said bonding arm and said housing which, when actuated, releases said bonding arm permitting it to lower toward the workpiece under its own weight;

a plurality of electro-mechanical search height actuators, mounted on said bonding arm, each of which can be locked in a fully extended state as directed by the switching mechanism, each engaging a mechanical stop. mounted on said housing impeding the downward travel of said bonding arm, until the position of the underlying workpiece can be adjusted accordingly;

a least one electro-mechanical loop height actuator mounted on the housing above the bonding arm engaging a mechanical stop attached to the bonding arm, arranged so as to strike the fully extended loop height actuator when the bonding arm rises after completion of the first bond of the bonding cycle, thereby defining the maximum loop height of the wire above the workpiece;

a clamp motion arm pivotally attached at one end to said bonding arm and extending along the length thereof;

resilient means mounted to pivot the other end of said arm upwardly;

wire clamp means for gripping the wire mounted on said clamp motion arm;

a pair of clamp motion arm actuators mounted on said bonding arm, each of which in its activated, fully extended state pushes against said clamp motion arm, holding it in one of two fixed positions relative to the bonding arm; and the rearmost one in its deactivated, fully retracted state permitting said clamp motion arm, with the wire clamp means attached, to pivot upward due to the force exerted by said resilient means until stopped by contact with the other activated clamp motion arm actuator, and in so doing, changing the position of the wire clamp means relative to the bonding means tool; the motion occurring when said clamp is open and not gripping the wire;

the other clamp motion arm actuator when also retracted allowing said resilient means to further pivot said clamp motion arm, the further motion occurring with the wire clamp closed and gripping said conductive wire such that said conductive wire is separated from said bond, leaving said bond tailless and a precise length of wire forward of the clamp;

said clamp motion arm actuators being operable to pivot said wire clamp means forward toward said bonding tool to feed a precise length of wire to protrude forward of said bonding tool, thereby providing a precisely controlled tail for the next bond;

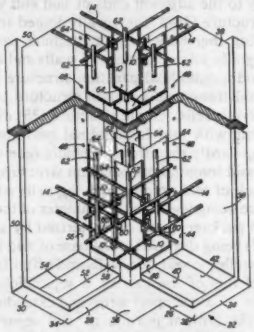
means for controlling the rate of the downward descent of said bonding arm to produce a predetermined maximum downward velocity and a uniform, repeatable force exerted by the impact of the bonding tool upon said conductive wire which is in contact with said workpiece regardless of the height from which said bonding arm is released, said means damping the vibratory moting of said bonding arm and said bonding tool after contact of the bonding tool with the workpiece to eliminate detrimental, counteracting forces at the exact moment of bonding.

4,234,118

APPARATUS FOR SIMULTANEOUS SOLDERING OF A PLURALITY OF DEVICES

Robert B. Bankes, and John W. Grubb, both of Reading, Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 873,579, Jan. 30, 1978, Pat. No. 4,146,166.
This application Dec. 18, 1978, Ser. No. 970,728
Int. Cl.³ B23K *1/12*
U.S. Cl. 228—49 R **3 Claims**



1. Apparatus for simultaneously condensation soldering a plurality of devices to one another, wherein each device has a body portion and a plurality of leads extending from said body portion, comprising:

a plurality of carriers, each having at least one opening for receiving a lead of a device to hold the device extending from the carrier in a cantilevered position;

means for positioning the carriers at a fixed angle with respect to one another so that each device extending from the carriers forms a crosspoint with at least one other device such that said crosspoint is sufficient to support an amount of solder thereupon;

means for subjecting the devices and solder to a heated gas to melt the solder at the device crosspoint; and

troughs located under each crosspoint to catch any excess solder which drips off the crosspoint during melting.

4,234,119

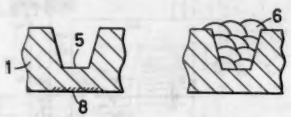
METHOD OF MAKING A STRUCTURE IMMUNE AGAINST STRESS CORROSION CRACKING

Isao Masaoka, and Katsuyuki Imai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 14, 1978, Ser. No. 933,555
Claims priority, application Japan, Aug. 12, 1977, 52-96033
Int. Cl.² B23K *31/02*
U.S. Cl. 228—125 **14 Claims**

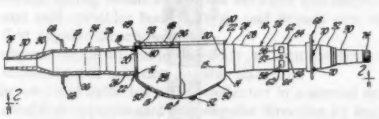
1. A method of making a structure immune against stress corrosion cracking which comprises forming a groove on the

side of a metallic structure opposite to the side thereof that is to be exposed to a corrosive atmosphere, said groove having a bottom that is formed by a part of the metallic structure that underlies the groove, filling-in the groove with layers of weld metal by build-up welding while cooling by holding a liquid coolant in contact with at least said part on the side to be



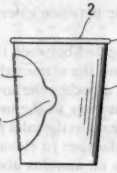
exposed to the corrosive atmosphere, said part having a thickness equal to at least the thickness of the first layer of the weld metal and said groove having a volume necessary for substantially reducing or eliminating a residual tensile stress on the surface of the side to be exposed to the corrosive atmosphere, owing to shrinkage of the weld metal deposited by the build-up welding.

4,234,120
AXLE HOUSING ASSEMBLY
William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Apr. 6, 1978, Ser. No. 893,895
Int. Cl.³ B23K *31/02*; B23Q *3/00*; F16H *57/02*
U.S. Cl. 228—173 C **3 Claims**



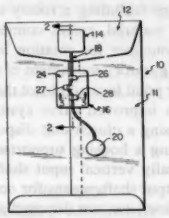
1. A method for making an axle housing including the steps of; forming a cup-shaped center housing having a bottom portion with a cylindrical wall extending about the periphery of said bottom portion from a flat plate and forming flattened portions diametrically opposed from each other on said cylindrical wall of said cup-shaped center housing, forming an opening in each of said flattened portions, connecting a tubular housing to each of said flattened portions by abutting the ends of the tubular housings against the flattened portions and about the openings therein and welding the tubular housings to the flattened portions.

4,234,121
CONTAINER FOR LIQUID
Toshihiko Sasaki, 2-26 Asahigaoka, Nerimaku, Tokyo, 176, Japan
Filed Apr. 2, 1979, Ser. No. 25,888
Int. Cl.³ B65D *41/02*, *43/02*
U.S. Cl. 229—1.5 B **4 Claims**



1. A combination of a container and a lid, said container having an open top and a side wall, said lid being sized and shaped to cover said top and formed with at least one radial extension, and said lid having a pressure sensitive adhesive layer provided on one side thereof over at least an area to cover said top but except said extension, the dimension of said side wall being at least as great as the width of said cover so that said cover may normally be attached releasably to said side wall by said adhesive layer, and a strippable backing material sized and shaped corresponding to said lid and fixed to the outside of said side wall for releasable attachment of said lid, whereby during shipment or storage said lid is attached by said adhesive to said backing material on said side and in use said lid is stripped from said backing material and attached by said adhesive to said top.

4,234,122
RECLOSABLE ENVELOPE
Harold R. Lillibridge, San Mateo, Calif., assignor to Champion International Corporation, Stamford, Conn.
Filed Feb. 28, 1979, Ser. No. 16,308
Int. Cl.³ B65D *27/20*
U.S. Cl. 229—77 **6 Claims**



1. A reusable, recloseable envelope comprising:
an enclosed body portion hingedly connected to an overlying flap;
a first tab rigidly connected to the outer surface of said flap by an adhesive;
a second tab rigidly connected to the outer surface of said body portion by an adhesive; and
means for releasably interconnecting said first and second tabs to thereby releasably secure said overlying flap and said body portion, said means including an elongated flexible member;
said second tab including a support portion having upper, central, and lower elongated fingers spaced along said support portion, each said elongated finger having a base and at least two opposed sides, the bottom surface of each said elongated finger being free of adhesive, with said elongated fingers extending generally parallel to each other, and with said central elongated finger being disposed in a direction opposite that of said upper and lower elongated fingers, with the tip of said central elongated finger extending beyond the bases of said upper and lower elongated fingers, and with the longitudinal axis of said elongated fingers being substantially perpendicular to the longitudinal axis of said elongated flexible member, said bases being integral with said support portion and said opposed sides being separated from and laterally bounded by said support portion, whereby said flexible member is capable of being releasably weaved between the bottom surface of said elongated fingers and the top surface of said body portion.

4,234,123

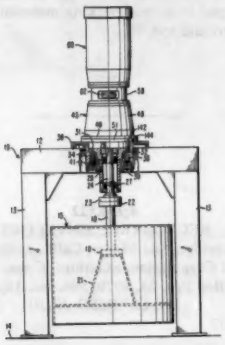
CENTRIFUGE DRIVE SYSTEM

Halsey W. Cory, Fairfield, Ohio, assignor to Force Control Industries, Inc., Hamilton, Ohio

Continuation of Ser. No. 904,765, May 11, 1978, abandoned, which is a continuation of Ser. No. 777,312, Mar. 14, 1977, abandoned. This application Jul. 5, 1979, Ser. No. 54,763

Int. Cl.³ B04B *9/12, 9/14, 15/02*

U.S. Cl. 233—23 R **8 Claims**



1. In a centrifuge including a rotary container adapted to receive a load of material, means connected to a frame and supporting said container for rotation in suspended relation and providing for gyratory movement of said container generally about a center point located above the center of gravity of said container, an improved drive system for rotating said container, comprising a clutch unit disposed above said container and including a housing supported by said frame and enclosing a generally vertical input shaft disposed above an axially aligned output shaft, means for connecting said output shaft to said container, a motor disposed above said clutch unit and having a generally vertical drive shaft connected to said input shaft, a series of annular clutch plates mounted on said input shaft and interfitting with a series of annular clutch discs connected for rotation with said output shaft, means for compressing said clutch plates and discs together to effect driving of said output shaft and said container by said motor through said input shaft, means for directing a flow of cooling and lubricating oil within said housing between said clutch discs and plates, and means for locating said clutch unit with said center point of gyratory movement of said container generally within said series of clutch plates.

4,234,124

CONTROL SYSTEM FOR GAS KILN

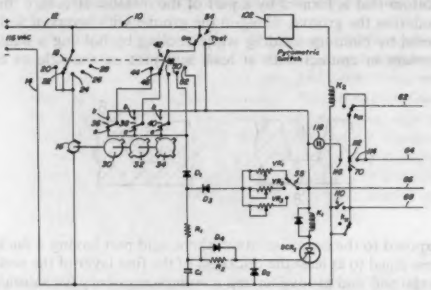
Harry A. Yarrow, 135 S. Sparks St., Burbank, Calif. 92506

Filed Aug. 1, 1978, Ser. No. 929,991

Int. Cl.³ H05B *1/02*

U.S. Cl. 236—15 BG **13 Claims**

1. A control for a heating device comprising: time delay means including a capacitor, a resistor, and a thyratron device controlled by the electrical discharge from said capacitor through said resistor for providing a heat control signal, said heat control signal being of a predetermined duration; actuation means for actuating said time delay means at predetermined periodic intervals; and means for adjusting said time delay means to vary the duration of said heat control signal,



heat control means responsive to said heat control signal to vary the heat supplied to the heating device.

4,234,125

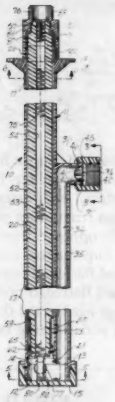
POP-UP SPRINKLER

Calvin A. Lieding, Glendora, Calif., assignor to Irrigation Specialties Company, San Gabriel, Calif.

Filed Oct. 17, 1979, Ser. No. 85,807

Int. Cl.³ B05B *15/02, 15/10*

U.S. Cl. 239—111 **10 Claims**



1. An irrigation sprinkler, comprising:

a housing having a water inlet passage and an internal wall defining an elongated upright bore connected to the inlet passage;

a riser having upper and lower ends, and a flow passage extending between the ends, the upper end being adapted to receive a sprinkler head, the riser being fitted in the bore to be movable between extended and retracted positions;

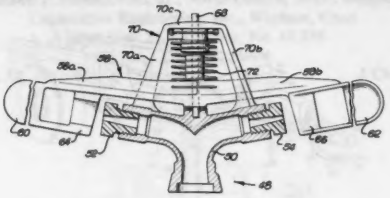
resilient means connected between the housing and riser for urging the riser into the retracted position;

seal means mounted adjacent the lower end of the riser for slidably sealing the riser to the internal wall so line-pressure water introduced to the inlet passage and flowing into the bore beneath the riser to elevate the riser is prevented from flowing into an annulus above the seal means and between the riser and the internal wall, the seal means being further configured to open a flow path for static water beneath the riser to flow into the annulus during riser retraction when flow of line-pressure water into the sprinkler is terminated.

4,234,126
BALANCED, REACTION IMPACT SPRINKLER

Norman D. Morgan, Pasadena, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Continuation-in-part of Ser. No. 843,711, Oct. 20, 1977, abandoned. This application Apr. 10, 1979, Ser. No. 28,708
Int. Cl.³ B05B *3/00*
U.S. Cl. 239—230 **10 Claims**

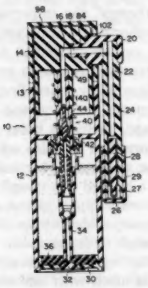


1. A water sprinkler of the impact-arm type comprising:
a bifurcated sprinkler body having a substantially vertically oriented intake portion and two symmetrically arranged diametrically opposed discharge portions adapted to receive two nozzles, said sprinkler body being mounted for rotation in a first angular direction about a substantially vertical axis
an impact arm mounted on said sprinkler body for rotation about the same axis as said body, said impact arm having two diametrically opposed portions carrying oppositely facing deflector spoons at the ends thereof;
torsional spring means connected between said impact arm and said sprinkler body to urge said impact arm in said first angular direction; and
abutment means affixed to said body, to limit rotation of said impact arm in said first angular direction;
whereby said deflector arm is deflected in a second angular direction opposite said first angular direction by impingement of water on said oppositely facing deflector spoons, and returns, under the influence of said spring, to impact said abutment means and drive said sprinkler body in said first angular direction, and whereby non-axial nozzle reaction forces or impact arm acceleration forces, and unbalanced gravitational forces acting on the sprinkler are substantially eliminated.

4,234,127
MANUALLY OPERATED SPRAYER

Tetsuya Tada, Tokyo, and Masaharu Amari, Onoda, both of Japan, assignors to Canyon Corporation, Tokyo, Japan

Filed Aug. 9, 1978, Ser. No. 932,404
Claims priority, application Japan, Feb. 1, 1978, 53/10937[U]; Apr. 14, 1978, 53/43265; May 22, 1978, 53/68756[U]
Int. Cl.² B05B *9/43*
U.S. Cl. 239—333 **16 Claims**

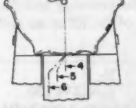


1. In a manually operated sprayer provided with a pump mechanism for sucking up a liquid received in a container into a cylinder through a primary valve when a piston slides upward, pressurizing the liquid and spraying it through a secondary valve,
the improvement wherein:
said secondary valve of the pump mechanism comprises a valve body normally pressed against a valve seat by a compression spring, the piston being a tubular piston; valve sealing means sliding in liquid-tightness along the inner wall of the tubular piston, thereby temporarily obstructing the flow of the liquid even after the valve body is removed from the valve seat; and valve seal-releasing means for releasing the valve-sealing means from its liquid-tight condition after the valve-sealing means has slid over a prescribed distance; and
said pump mechanism further comprises a pair of skirt-like piston-sealing strips spatially provided on the periphery of the piston to define a retention space therebetween for a mass of pressurized liquid left in the cylinder; and piston seal-releasing means which, when the piston falls to the proximity of its lower dead point, discharges a mass of pressurized liquid left in the cylinder into the retention space by means of a sealing strip disposed on the side of the primary valve, and, when the piston falls for a prescribed distance before reaching its lower dead point, discharges a mass of pressurized liquid remaining in the retention space by means of a sealing strip positioned on the side of the secondary valve section.

4,234,128
NOZZLE ASSEMBLY

David R. Quinn, Pembroke Pines, and Walter H. Wesner, Plantation, both of Fla., assignors to The AFA Corporation, Miami Lakes, Fla.

Filed Feb. 6, 1978, Ser. No. 875,357
Int. Cl.³ B05B *1/12*
U.S. Cl. 239—478 **17 Claims**



17. An adjustable nozzle assembly for a hand-operated compression liquid ejection device, the device having a discharge end, a nozzle coupled to and embracing said device discharge end, and device discharge end being relatively adjustable, in sequence, from an OFF position in which said device is disabled, to another one of a plurality of different positions each of which different positions provides an individually characterized device ejection or discharge mode or pattern, said nozzle and said device discharge end each having two contiguous surfaces that are disposed in cooperative relation with the contiguous surfaces of the other, in each of which surface passageways are formed, which passageways when brought into register by relative adjustment of said nozzle and said device discharge end determine the discharge mode of said device.

4,234,129
MOUNTING DEVICE FOR AGRICULTURAL SPREADING MACHINES

Heinz Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany, assignor to Amazonen-Werke H. Dreyer GmbH & Co. KG, Hasbergen-Gaste, Fed. Rep. of Germany

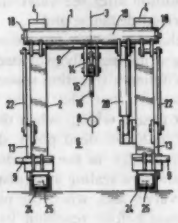
Filed May 19, 1977, Ser. No. 798,524

Claims priority, application Fed. Rep. of Germany, May 20, 1976, 2622444

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.[2] **A01C** *19/00;* **B62D** *49/02*

U.S. Cl. 239—661 **15 Claims**



1. In a mounting device for an argricultural spreading machine, which has an upright frame equipped with coupling means for mounting of the device on a tractor power lift, and coupling means for mounting of a spreading machine, driven by a power takeoff shaft of the tractor and equipped with outlet apertures, on the device, and lift means for raising and lowering the elevation of the spreading machine on the device, the improvement which comprises there being only one of said lift means, the upright frame having an open middle area for the free passage and pivoting of a universal shaft connecting the tractor power takeoff to the spreading machine during raising and lowering of the spreading machine on the device, the upright frame having two upright members disposed one on each side at an equal distance from the center line of the mounting device and joined together by a cross member, the lift means being located outside of said open middle area, the mounting device comprising lift arms pivotally connected to the upright frame members and having means for mounting of the spreading machine thereon, the lift means being linked to the lift arms for said raising and lowering of the spreading machine on the mounting device, the linkage of the lift means to the lift arms comprising levers, each pivotally mounted at one end thereof on the upright frame members, the other ends of the levers being joined together by a crossbar, links connecting said other ends to the lift arms, the lift means being operatively connected to the crossbar and the upright frame for said raising and lowering of the lift arms and thereby the spreading machine.

4,234,130
HYDRAULIC CYLINDER ASSEMBLY FOR TWO-STAGE DISCHARGE ON MANURE SPREADER

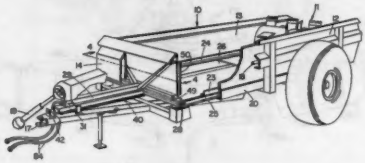
Clarence R. Trott, and David A. Willer, both of Welland, Canada, assignors to Deere & Company, Moline, Ill.

Filed Dec. 4, 1978, Ser. No. 966,030

Int. Cl.[3] **A01C** *3/06, 19/00*

U.S. Cl. 239—679 **8 Claims**

1. A material-handling implement comprising: a main frame; a material-containing box carried on the frame and open at its rear end and having transversely spaced upright sides, and a floor composed of front and rear sections, the former of which is supported to shift rearwardly to overlie the latter; a transverse beater mechanism supported on the box at its open rear end; a vertical transversely extending wall supported in the box to shift fore-and-aft with respect to and between the front and rear portion of the front section of the floor; a main cylinder between the frame and front floor section and having a cylindrical housing with a closed end and an open end through which a rod may extend and fluid openings in opposite ends of the cylinder; an associated rod contained in the cylinder with the latter extending through the open end of the cylindrical housing, said rod being composed of inner and outer concentric tubes sealed at their respective ends with the inner tube opening into the closed end of the cylindrical housing and the outer tube having a port opening to the rod end of the cylindri-



cal housing; a second double-acting cylinder having a cylindrical housing with a closed end and a rod end in fluid communication external of the main cylindrical housing with the inner tube and outer tube; and a shuttle valve within the main cylindrical housing supported for axial shifting with respect to the outer tube and for closing said port as fluid is introduced to the closed end of the main cylindrical housing and for opening said port as said piston and associated rod approach their fully extended position.

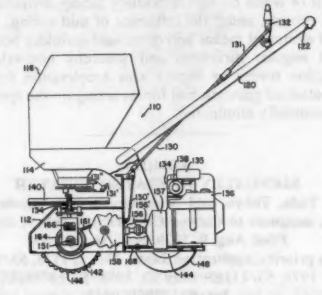
4,234,131
MOTORIZED DRY FERTILIZER SPREADER

Douglas W. Baker, Dayton, Ohio, assignor to Leisure Lawn, Inc., Dayton, Ohio

Filed Jan. 18, 1979, Ser. No. 4,585

Int. Cl.[3] **A01C** *17/00*

U.S. Cl. 239—685 **20 Claims**



1. In an impeller blade fertilizer spreader exclusively power driven itself and having a large capacity hopper with metering holes in a bottom thereof, the improvement in combination therewith which comprises: a substantially rectangular base frame structure, an engine carried at a rear location of said frame structure, a transmission with opposite outwardly extending output shafts suitably journalled relative to said frame structure, a handle means with rod and lever controls for the operation of the hopper metering holes and transmission, four wheels rotatably journalled in pairs with front and rear axle means on said frame structure, gear reduction means on one side of said engine, a limited slip coupling device operatively connected to said gear reduction means, a first pair of sprocket gears secured to the output shafts respectively, a second pair of sprocket gears secured to front axles means, parallel chain members interconnecting respectively said first pair of sprocket gears and in mesh with said second pair of sprocket gears, an impeller blade on a top end of a vertical shaft rotatably journalled on said frame structure to locate the impeller

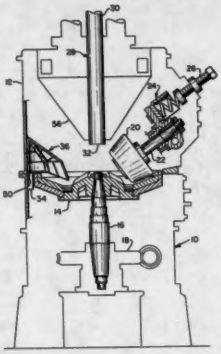
blade rotatably underneath the metering holes of the hopper, and bevel gear means simultaneously timing and interconnecting rotation of said impeller blade with only front wheel drive of the fertilizer spreader.

4,234,132

BOWL MILL WITH AIR DEFLECTOR MEANS

Theodore V. Maliszewski, Jr., North Canton, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 21, 1979, Ser. No. 41,155
Int. Cl.³ B02C *15/04*
U.S. Cl. 241—53 **3 Claims**



1. In a bowl mill operable for effecting therewithin the pulverization of material such as coal and including a separator body the inner surfaces of which define a substantially closed chamber therebetween, a grinding table supported for rotation within the separator body, means for rotating the grinding table within the separator body, at least one pair of grinding rolls mounted within the separator body in space relation one to another and in juxtaposed relation to the grinding table so as to coact therewith for purposes of effecting the pulverization of material disposed on the grinding table, material supply means supported on the separator body and operable for discharging onto the grinding table the material to be pulverized within the bowl mill, air supply means provided in the separator body terminating in at least one discharge outlet comprising an annular space formed between the inner surface of the separator body and circumference of the grinding table so as to be operative for purposes of discharging a flow of air through the annular space into the interior of the separator body, the improvement comprising:

a. an air deflector means disposed between the pair of grinding rolls in the path of flow of the air exiting through the annular space and operative deflect this flow of air over the grinding table, said air deflector means including a frame-like structure lined with an abrasive resistant material, said frame-like structure being of sufficient size to encompass the entire annular space so as to thereby effect the capture of all of the air exiting from the annular space, said frame-like structure including at least a first side wall and a second side wall joined to said first side wall, said first side wall extending substantially perpendicular to the plane of rotation of the grinding table and terminating in a free edge, said second side wall extending substantially parallel to the plane of rotation of the grinding table and terminating in a free edge;

b. support means supporting said frame-like structure within the separator body so that at least a portion of said frame-like structure is located in abutting engagement with the inner surface of the separator body preventing thereby the flow of air and material between the inner surface of the separator body and said frame-like structure, said support means also supporting said frame-like structure so that said first side wall is positioned in spaced relation to a first one of the pair of grinding rolls such that said free edge of said first side wall is operative as a leveler to insure the presentation of a uniform layer of material to the first one of the pair of grinding rolls and so that said second side wall is positioned in spaced relation to the second one of the pair of grinding rolls such that said free edge of said second side wall is spaced a sufficient distance from the second one of the pair of grinding rolls in order to thereby inhibit the development of an area of stagnant air therebetween; and

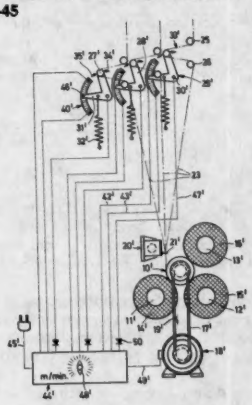
c. means provided in the annular space adjacent the exit end thereof, said means being mounted on the side walls that define the annular space so as to have one end thereof positioned adjacent the exit end of the annular space and the other end thereof located within the annular space at a spaced distance from said one end thereof, said one end of said means projecting inwardly into the annular space to a considerably greater extent than does said other end of said means so as to establish an inclined surface therebetween, said inclined surface lying within the path of flow of air through the annular space so as to be operative to effectuate a peeling away of the air from engagement with the side walls that define the annular space as the flow of air exits from the annular space prior to the engagement of the flow of air with said frame-like structure and the subsequent deflection of the flow of air over the grinding table by said frame-like structure.

4,234,133

DEVICE FOR WINDING TEXTILE THREADS

Heinrich Enneking, Karlsruhe-Waldstadt, Fed. Rep. of Germany, assignor to Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 852,368, Aug. 22, 1969, abandoned. This application Feb. 10, 1972, Ser. No. 225,157
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1968, 1785336
The portion of the term of this patent subsequent to Jun. 18, 1995, has been disclaimed.
Int. Cl.² B65H *59/38, 54/20*
U.S. Cl. 242—45 **2 Claims**



1. In a device for winding synthetic resin textile threads on bobbins at a substantially constant winding speed, of the type including a compensating roller engageable with a thread loop and mounted on a movable arm for fine regulation of the thread tension, a drive roller driven by an electric motor, and bobbins interchangeably mounted on bobbin supports and pressed with a predetermined force into frictional engagement with the periphery of the drive roller for rotation thereby to wind a thread thereon, the improvement comprising, in combi-

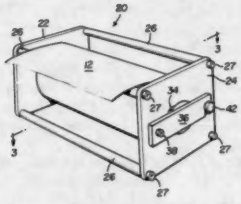
nation, a control device connected to a source of electric potential and to said electric motor and including a motor speed adjusting element controlled by said arm for movement in accordance with variations in thread tension, as determined by variations in said thread loop engaged by said compensating roller, to control continuously the speed of said electric motor to control continuously the peripheral speed of said drive roller to maintain the thread tension constant, said motor speed adjustment element comprising, a potentiometer connected to said device to have a potential from said source impressed thereacross; and an adjustable tap forming part of said potentiometer and connected to said device; said adjustable tap being mounted on said arm for adjustment of said potentiometer, there being plural synthetic resin textile threads each wound on a respective bobbin; each textile thread having the respective thread loop engaged by a respective compensating roller mounted on a respective movable arm; a respective potentiometer associated with each movable arm and including a sliding contact carried by the assoicated movable arm; said control device controlling the speed of said electric motor as a function of the displacements of said movable arms.

4,234,134

PAPER TENSIONING DEVICE

Samuel Rhine, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Filed Feb. 9, 1979, Ser. No. 10,654
Int. Cl.³ B65H *19/00*
U.S. Cl. 242—55.2 **12 Claims**



1. In a chart recorder, densitometer or other instrument of the type including a supply of paper tightly wound around into a roll in the form of a hollow cylinder, the instrument including a support frame with a pair of spaced apart first and second support walls between which is rotatably supported the supply of paper, the improvement comprising:

a cylinder tubular core extending through the supply of paper and supporting same;

a cylindrical plug received in and secured to said tubular core, said plug having a bore;

an elongated spindle having first and second ends, said spindle extending through the interior of said core and having a length greater than the length of said core;

the support frame including a socket in said first support wall;

said spindle including a flange at the second end thereof, said support frame including an aperture in the second support wall to receive said spindle therethrough, said aperture having a countersunk bearing surface to receive said flange;

said spindle and plug having end portions thereof engaging said socket and aperture provided in the walls of said support frame for rotatably mounting said core and supply of paper in said frame;

said plug having an internal keyway and said elongated spindle having an axially extending key engaging said keyway for preventing relative rotation of said plug and said spindle;

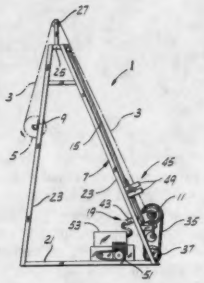
said support frame further including means to exert an axial pressure on said spindle adjacent to said second end to urge said flange against said countersunk bearing surface in said second support wall, effective to assist in retarding rotation of said spindle and said plug keyed thereto thereby exerting a drag on said tubular core to resist free rotation and to resist unwinding of the paper from the core.

4,234,135

WEB INSPECTION APPARATUS

William R. Conner, Jr., Shelbyville, Tenn., assignor to Kellwood Company, St. Louis, Mo.

Filed Sep. 10, 1979, Ser. No. 73,996
Int. Cl.³ B65H *19/20, 17/02*
U.S. Cl. 242—56 R **15 Claims**



1. Apparatus for feeding a web of material from a supply thereof through an inspection area and winding the web, comprising:

a frame;

means mounting the supply on the frame;

a mandrel for winding the web rotatably mounted on the frame having means for releasably gripping a leading end portion of the web;

means for rotating the mandrel for winding the web thereon and for feeding the web through the inspection area;

means for backing the web fed through the inspection area extending along the path of movement of the web between the supply and the mandrel;

means mounting the backing means on the frame for movement between an operative position relative to the mandrel for starting the winding of the web and a retracted position away from the mandrel, the backing means being engageable with the leading end portion of the web; and

means for moving the backing means between operative and retracted position;

the means for releasably gripping the web of material comprising a plurality of holes in the periphery of the mandrel and vacuum means in communication with the holes for drawing air into the mandrel through the holes, the backing means when moved to operative position moving the leading end portion of the web toward engagement with the mandrel for being vacuum gripped by the gripping means, and when in retracted position enabling rotation of the mandrel for the feeding of the web through the inspection area.

4,234,136

APPARATUS FOR THE REPLACEABLE MOUNTING OF A WINDING DRUM FOR WEB-LIKE MATERIAL

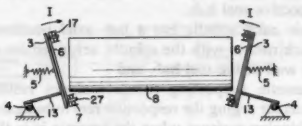
Hubert Wenzel, Seelze, and Reinhard Mössinger, Neustadt, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed May 17, 1979, Ser. No. 39,876

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1978, 2818188

Int. Cl.[3] B65H *17/02*

U.S. Cl. 242—68.4 7 Claims



1. An apparatus for the replaceable mounting of a winding drum for web-like material, said winding drum having two end faces, said apparatus comprising in combination two supporting carriers for rotatably holding said winding drum at both of said end faces, said carriers being respectively pivotally mounted in said apparatus about substantially horizontal axes, and means normally retaining said carriers in rest position subject to pivotal movement of said carriers being initiated completely automatically as soon as said winding drum to be inserted is lowered into the apparatus until said drum is supported at both end faces whereas an emptied drum can be readily removed whereby said carriers automatically swivel up and cease the rotary movement.

4,234,137

TAPE REEL FOR VIDEO TAPE CASSETTE

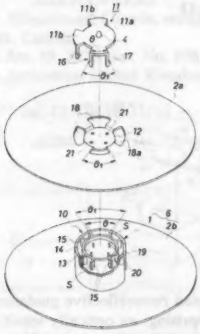
Koji Watanabe, Niiza, and Akira Nakagawa, Tokyo, both of Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Aug. 13, 1979, Ser. No. 65,810

Claims priority, application Japan, Aug. 11, 1978, 53-97296

Int. Cl.[3] B65H *75/14*

U.S. Cl. 242—71.8 6 Claims



1. A tape reel for a video tape cassette, comprising: a hub having first and second end surfaces; a first flange disposed on said first end surface of said hub; first engaging means carried by said hub near said second end surface; a second flange having a plurality of openings and arranged to be positioned against said hub second end surface; a carrier member having a small integrally formed protuberance at the center of one surface ad resilient second engaging means disposed on the other surface thereof, said carrier member being arranged to contact said second flange opposite said hub second end surface with said second engaging means passing through said openings of said second flange and resiliently lockingly engaging said first engaging means of said hub, whereby the locking engagement between said first and second engaging means fixes said second flange between said carrier member and said second end surface of said hub.

4,234,138

THREAD GUIDE AT A WARP CREEL

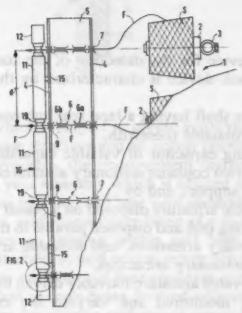
Rudolf Gehring, Niederuzwil, and Albert Brandenberger, Oberuzwil, both of Switzerland, assignors to Maschinenfabrik Beninger AG, Uzwil, Switzerland

Filed Sep. 4, 1979, Ser. No. 72,191

Claims priority, application Switzerland, Sep. 15, 1978, 9658/78

Int. Cl.[3] B65H *49/02;* D02H *1/00*

U.S. Cl. 242—131.1 7 Claims



4. A thread guide arrangement at a bobbin creel comprising, in combination:

a thread tensioning device through which there is essentially linearly guided a thread which is payed-off of a bobbin;

a deflection device for deflecting the thread, upon its exit from the creel, in the direction of a winding machine;

said deflection device imparting to the thread only a single deflection during its movement between the bobbin and upon leaving the creel;

said deflection device comprising a deflection roll having a lengthwise axis and by means of which there is accomplished said deflection;

bearing means for mounting said deflection roll so as to be freely rotatable with its lengthwise axis extending essentially vertically;

said deflection roll having a travel groove, the periphery of said travel groove being arranged substantially along the axis of the thread travel from the bobbin until departure from the thread tensioning device and located at the outlet side of the thread from the thread tensioning device;

said deflection device comprises a plurality of said deflection rolls;

deflection roll tube means provided for said deflection rolls;

all of said deflection rolls operatively associated with a vertical bobbin row of the creel being arranged at a deflection roll tube means;

means for attaching said deflection roll tube means at a part of the creel;

said creel part serving to house the thread tensioning devices for the threads of all of the bobbins which form a vertical row in the creel;

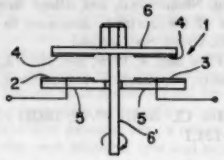
each deflection roll tube means comprises tube sections, the length of which is accommodated to the spacing of two neighboring thread tensioning devices; and

said tube sections being provided at their ends with insert elements by means of which the tube sections can be connected to one another while clamping therebetween a respective deflection roll.

4,234,139
DEVICE FOR THE DETECTION OF THE STATE OF ROTATION OF A SHAFT, IN PARTICULAR FOR TAPE DECKS

Eliseo Porchia, Rome, Italy, assignor to Autovox, Rome, Italy

Filed Feb. 26, 1979, Ser. No. 15,084
Claims priority, application Italy, Mar. 9, 1978, 48256 A/78
Int. Cl.[3] G11B *15/32*; G03B *1/02*; H01G *5/00*
U.S. Cl. 242—191 13 Claims



1. A device for the detection of the state of rotation of a shaft, which device is characterized by the fact that it comprises:

a driven shaft having a tape reel hub carrying disk thereon and rotatable therewith,

a rotating capacitor of variable capacitance, formed by at least two coplanar stationary armatures disposed on a first fixed support, and by

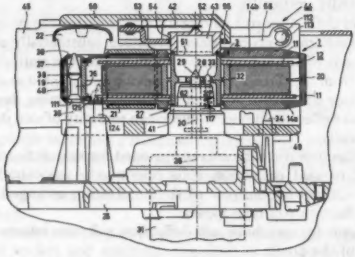
a movable armature disposed on a planar surface of said hub carrying disk and disposed parallel to the plane of said two stationary armatures, said movable armature facing said two stationary armatures,

said movable armature movably driven by the shaft which is being monitored and varying the capacitive coupling between the stationary armatures and thereby creating a tape drive control signal.

4,234,140
MAGNETIC TAPE CASSETTE DRIVE SYSTEM

Cornelis P. Van Nie, Eindhoven, Netherlands; Franz Werner; Gerhard Maryschka, both of Vienna, Austria, and Joannus H. F. C. Sieben, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,645
Claims priority, application Netherlands, Aug. 28, 1978, 7808832
Int. Cl.[3] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—199 9 Claims



1. A magnetic tape cassette apparatus adapted for use with a flip-over magnetic tape cassette having two reel hubs spaced from each other and rotatable about parallel axes of rotation, comprising

a frame,

cassette supporting means connected to the frame for engaging an external surface of a magnetic tape cassette for operative cooperation of the apparatus with magnetic tape in the cassette, said means comprising a cassette holder mounted to the frame for movement between an open position, for inserting or removing said magnetic tape cassette, and a closed position for retaining the cassette in an operating position, and

a drive arrangement comprising first and second drive spindles rotatable about parallel axes; each drive spindle including centering means for engaging a respective reel hub in the cassette for positioning the hub coaxially about the respective spindle rotation axis, and a drive pin disposed at a given radial distance from the respective axis, said pin being adapted to engage a drive aperture in said respective reel hub,

wherein each spindle has a hub axial positioning surface which rotates with the spindle, arranged for engaging an end wall of the reel hub, and

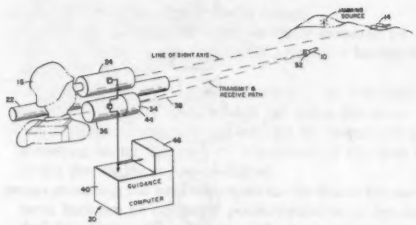
the cassette supporting means includes resilient loading means for urging the respective reel hubs against said axial positioning surfaces when the cassette is in the operating position,

said loading means comprising first and second hub loaders rotatably journalled with axial and radial play in the cassette holder, disposed opposite the respective spindles when the holder is in the closed position, each hub loader having a centering portion arranged for engaging a centering surface on the respective hub; and spring means for engaging the loaders for urging the loaders toward the spindles thereby bringing the loader centering portion into engagement with the centering surface on the hub, each pressure spring cooperating with the respective loader through a point contact at a central location opposite the centering portion.

4,234,141
RANGE GATED RETROREFLECTIVE MISSILE GUIDANCE SYSTEM

Walter E. Miller, Jr.; Jimmy R. Duke; George W. Starkey, and Robert L. Sitton, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 10, 1970, Ser. No. 24,415
Int. Cl.[3] F41G *7/26*
U.S. Cl. 244—3.13 4 Claims



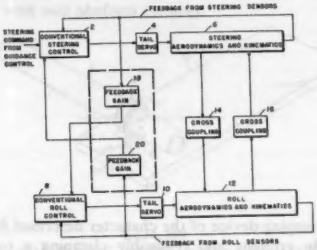
1. A range gated retroreflective guidance system for a missile system comprising: an optically sensitive receiver within the housing of a missile to be tracked for command control of said missile, a tracking station having an optical transmitting means for transmitting a periodic burst of light energy toward said missile optical receiver for providing a missile guidance signal, a telescope at said tracking station for maintaining directional alignment between said target and said tracking station, optically sensitive missile tracking means at said tracking station for following the direction of flight of a missile, and a retrodirective corner-cube prism adjacent said optical receiver for reflecting a portion of said optically transmitted guidance signal from said missile to said optical tracking means.

4,234,142

HIGH ANGLE-OF-ATTACK MISSILE CONTROL SYSTEM FOR AERODYNAMICALLY CONTROLLED MISSILES

David J. Yost, Woodbine; Arthur Arrow, Beltsville, and Robert L. Konigsberg, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 8, 1978, Ser. No. 913,981
Int. Cl.[3] F41G 7/00; G05D 1/08
U.S. Cl. 244—3.21 18 Claims



1. A missile control system, which is stable at low and high angles-of-attack, having means for controlling roll tail deflection and means for controlling steering tail deflection and having roll sensors for providing roll signals and steering sensors for providing steering signals, respectively, the improvement comprising:

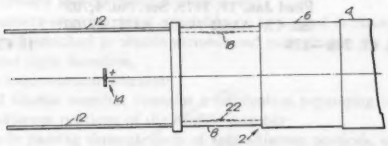
feedback means for intentionally cross-coupling the roll signals into the steering tail deflection control means which compensate for steering changes due to induced roll at high angles of attack and for intentionally cross-coupling the steering signals into the roll tail deflection control means which compensate for roll changes due to induced steering at high angles of attack.

4,234,143

TRAVERSING AND HOUSING SYSTEM FOR HELICOPTERS

Mario A. Pesando, Mississauga, Canada, assignor to DAF Indal Ltd., Mississauga, Canada

Filed Jan. 19, 1978, Ser. No. 870,698
Claims priority, application United Kingdom, Jan. 20, 1977, 2348/77
Int. Cl.[3] B63B 35/50
U.S. Cl. 244—116 4 Claims



1. A traversing and housing system comprising; a telescopic hangar structure having an enclosure section fixed to a firm base, tracks fixable to the base and extending away from one end of each side of the fixed section, one or more movable enclosure sections movable along the tracks from a retracted position where they are telescoped within one another and within the fixed enclosure section, to an extended position with all the sections substantially in end to end relationship, connecting means coupled to and arranged within a movable section furthest from said fixed section, said connecting means being arranged to secure a movable vehicle enclosed within said movable section when said movable section is at its extended position or being moved.

4,234,144

BASE VENT ASSEMBLY FOR ENTRY SPACE VEHICLES

Ray O. Charette, Fountain Valley, and Elmer J. Yates, Irvine, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 24, 1978, Ser. No. 955,062
Int. Cl.[3] B64G 1/62
U.S. Cl. 244—160 4 Claims

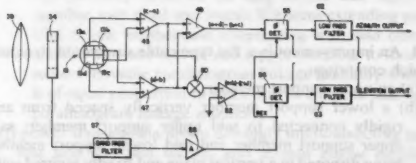
1. In a vehicle which is subject to severe aerodynamic heating and having a base structure and an access opening located within said base structure, the improvement therein being in the form of a base vent assembly which is utilized in conjunction with said access opening, said base vent assembly comprising an access cover, said access cover being of a size sufficient to overlap said access opening within said base structure, means operably attached to said access cover for removably securing said access cover to said base structure, a plurality of spacers, each of said spacers being located adjacent each of said securing means for spacing said access cover a predetermined distance from said base structure, a plurality of wedge-shaped deflector members secured to said base structure interposed between said plurality of spacers, respectively, the portion of said access cover located adjacent said wedge-shaped deflector members having a shape which conforms to the shape of said wedge-shaped deflector members, said access cover being spaced from said wedge-shaped deflector members said predetermined distance, and said predetermined distance being constant throughout.

4,234,145

RADIANT ENERGY QUADRANT DETECTION DEVICE

Teague N. Leiboff, Redondo Beach, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed May 17, 1978, Ser. No. 907,154
Int. Cl.[2] F41G 7/00
U.S. Cl. 244—3.16 7 Claims



1. A radiant energy detector device for generating output signals representing the departure in altitude and azimuth of a target from a predetermined reference axis, comprising:

a. an array of four radiant energy detectors arranged in a common plane in a substantially square configuration, each of said detectors occupying a separate quadrant of the square,

b. a frame,

c. means for mounting said detector array on said frame,

d. a lens for focusing radiant energy from said target onto the detector array,

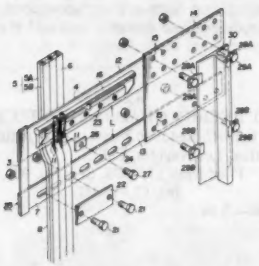
e. means for supporting said lens on the frame,
f. chopper means mounted in the lens supporting means and positioned between the lens and the detector array for chopping the radiant energy focused onto the target array,
g. synchronizing circuit means for generating a synchronous drive signal from said chopper means,
h. a pair of electronic circuit means mounted on said frame in proximity to said detector array, each for directly receiving the outputs of a diagonally opposite pair of the detectors and subtracting each of said paired outputs from each other,
i. summing circuit means mounted on said frame for receiving the outputs of said pair of electronic circuit means and summing said last mentioned outputs together in a predetermined manner to provide a first signal in accordance with the departure in azimuth of the target from a predetermined axis and a second signal in accordance with the departure in elevation of the target from said axis,
j. first and second phase detector circuit means mounted on said frame for receiving said first and second signals respectively and a reference signal from said synchronizing circuit means, and generating pulsating DC signals in response thereto, and
k. first and second filter circuit means mounted on said frame for receiving the outputs of said first and second detector circuit means respectively for producing smooth DC signals representing the departure in azimuth and elevation of the target from said reference axis.

4,234,146

FLAT TYPE CABLE SUSPENSION STRUCTURE

Eiji Shima, Yokohama; Masao Shimizu, Funabashi, and Hiroshi Den, Yotsukaido, all of Japan, assignors to FEBS International, Ltd. and The Fujikura Cable Works, both of Tokyo, Japan

Filed Sep. 12, 1978, Ser. No. 941,474
Claims priority, application Japan, Mar. 14, 1978, 53-28259
Int. Cl.³ E21F *17/02*
U.S. Cl. 248—63 **7 Claims**



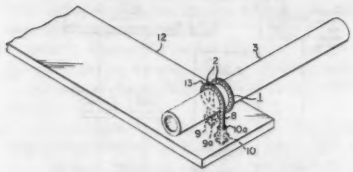
1. An improvement in a flat type cable suspension structure which comprises:
(a) an upper support member;
(b) a lower support member vertically spaced from and rigidly connected to said upper support member; said upper support member and said lower support member being disposed in a vertical plane and fixedly secured with respect to the ground;
(c) a flat type jacketed cable extending in a substantially vertical direction and having on one face a portion abutting against the rear side of said upper support member and on an opposite face a portion abutting against the front side of said lower support member;
(d) a tension member longitudinally extending and buried in the jacket of said flat type cable having an exposed portion partially taken out of said jacket; and
(e) means for securing said exposed portion of the tension member to said upper support member, thereby holding the flat type cable in a suspended fashion, said means being fixedly attached to said upper support member.

4,234,147

SHAFT-CLAMPING DEVICE

Charles M. Cleaveland, North Huntington, and Peter M. Kowalik, Trafford, both of Pa., assignors to Cleaveland/Price Enterprises, Inc., Trafford, Pa.

Filed Jan. 15, 1979, Ser. No. 3,654
Int. Cl.³ F16L *3/08*
U.S. Cl. 248—74 R **11 Claims**



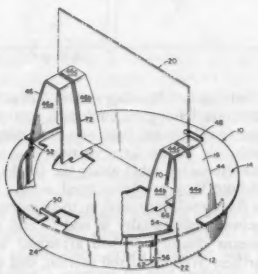
1. A clamping device of the character described for tightly frictionally gripping and releasably clamping a rod-shaped member (3) firmly to a secondary member (12) comprising, in combination, means defining a loop-bolt (1) threaded in its entirety and having a pair of threaded end legs (7, 8) adapted for spirally frictionally encircling the rod-shaped member (3) for thereby exerting a substantially uniform radial inward clamping pressure-load thereon, means defining a secondary member (12) to be frictionally clamped to the rod-shaped member (3) and having a pair of spaced mounting apertures (9*a*, 10*a*) provided therein, the free ends of the two leg members (7, 8) of the entirely threaded loop-bolt (1) projecting through the two spaced mounting apertures (9*a*, 10*a*) of the secondary member (12), and adjustable fastening means provided on the extremities of the threaded legs (7, 8) of the loop-bolt (1) and located upon the opposite side of said secondary member (12), whereby the threads provided upon the surface of the loop-bolt (1) bite into the outer surface area of the rod-shaped member (3) and thereby prevent relative rotation between the rod-shaped member (3) and the secondary member (12).

4,234,148

DISPLAY STAND

Robert Maddestra, Canton, and David E. Munn, Framingham, both of Mass., assignors to Damon Corporation, Needham Heights, Mass.

Filed Jan. 19, 1979, Ser. No. 4,705
Int. Cl.² A45D *19/04;* **A47G** *29/00*
U.S. Cl. 248—174 **10 Claims**



1. A display stand comprising

a platform member of sheet stock material, and

a support member of sheet stock material,

said support member having a base element disposed below and in supporting engagement with said platform member and having at least one pedestal-forming arm element with first and second successive sections extending laterally from said base element and projecting through an aperture in said platform member,

said arm element bending back upon itself between said first and second sections at a location above said platform member, and

said second section extending from said bend to an attachment with said platform member.

4,234,149

TILTING ADJUSTING MECHANISM FOR A CAMERA TRIPOD

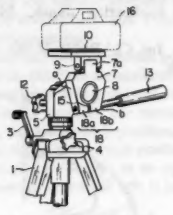
Michio Kawazoe, 30-11, 5 chome, Higashi Narita Suginami ku, Tokyo, Japan

Filed May 5, 1978, Ser. No. 902,914

Claims priority, application Japan, Dec. 2, 1977, 52-162484

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—184 **2 Claims**



1. In a camera tilting adjusting mechanism for a tripod having a vertical elevator shaft and having

a rotatable member rotatable on a first horizontal shaft attached to said rotatable member and extending in the forward and rearward direction, and

a camera-securing plate rotatable on a second horizontal shaft attached to tiltable member and extending in the left and right direction,

the improvement wherein:

said tiltable member contains a bifurcation separating two adjacent portions of the tiltable member;

a hole passing through each of said adjacent portions, said holes being of the same diameter and aligned with each other and having threads of the same pitch and direction

a reversible handle member protruding from the tiltable member, said handle member having a first section threadable to the threads of said holes, a second section of a diameter larger than the diameter of said holes and a third section of a smaller diameter than said holes providing a clearance for said threads and located between the first and second sections so that a shoulder is formed at the junction of said first and third sections;

whereby said shoulder is adapted to abut either of said adjacent portions of the tiltable member when said first section is threaded into the hole remote from the shoulder.

4,234,150

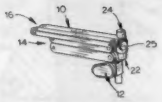
MECHANICAL ARM ASSEMBLY

Francis H. A. Mee, Aurora, and Henry J. Taylor, Willowdale, both of Canada, assignors to Spar Aerospace Limited, Toronto, Canada

Filed Feb. 2, 1979, Ser. No. 9,378

Int. Cl.[3] E04G *3/00*

U.S. Cl. 248—281.1 **15 Claims**



1. A manipulator comprising;

(a) a first arm having a proximal end and a distal end,

(b) a second arm having a proximal end and a distal end,

(c) an elbow member disposed between the distal end of said first arm and the proximal end of said second arm,

(d) said first arm comprising;

(i) a first end support member at the proximal end thereof,

(ii) a first pair of linkage members of equal length, said first pair of linkage members consisting of a first and second link arm each having a proximal end pivotally mounted on said first end support and a distal end pivotally mounted on said elbow member, said first and second link arms extending parallel to one another and cooperating with said first support end and said elbow member to form a first movable parallelogram linkage assembly,

(e) said second arm comprising;

(i) a second end support member at the distal end thereof,

(ii) a second pair of linkage member of equal length and of a length equal to that of said first pair of linkage members, said second pair of linkage members consisting of third and fourth link arms each having a proximal end pivotally mounted on said elbow member and a distal end pivotally mounted on said second end support member, said third and fourth link arms extending parallel to one another and cooperating with said elbow member and said second end support member to form a second movable parallelogram linkage assembly which is of equal proportion to and a mirror image of said first parallelogram linkage assembly,

(f) power transmission means drivingly interconnecting said first arm and said second arm at said elbow member whereby angular movement of said first arm relative to said elbow causes identical angular movement of said second arm relative to said elbow thereby causing the distal end of said second arm to move in a straight line path relative to said proximal end of said first arm as said remote manipulator is extended and retracted,

(g) drive means at one end of one of said link arms operable to change the geometry of its associated parallelogram linkage assembly to thereby effect extension or retraction of the distal end of the second arm with respect to the proximal end of the first arm.

4,234,151

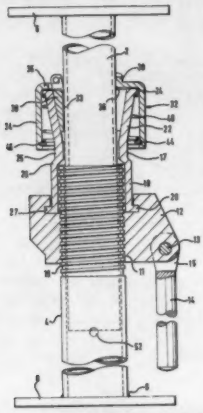
SELF-LOCKING ADJUSTABLE SUPPORT DEVICES

Alfryn I. John, 3 Waubant Rd., Kenfig Hill, Glamorgan, and Jack H. Moxham, 19 Birchwalk, Newton, Porthcawl, Mid Glamorgan, both of Wales

Filed Apr. 30, 1979, Ser. No. 34,379

Int. Cl.³ E04G *25/00*; F16M *13/00*

U.S. Cl. 248—354 S **9 Claims**



1. A self-locking adjustable support device comprising:

(a) two telescopically interfitting members;

(b) a housing;

(c) means connecting the housing to one end of one of said telescopically interfitting members in a manner permitting the housing to be adjusted in position longitudinally relative to said one member;

(d) said housing being formed with a portion having an internal frusto-conical surface arranged to receive therein a plurality of locking elements;

(e) said connecting means permitting rotation of said housing relative to said one member about its longitudinal axis to permit adjustment of the overall length of the support device;

(f) a cover member adapted to circumjace the free end of said housing with said locking elements depending therefrom into a space defined between said internal frustoconical surface of said housing and the outer surface of said other one of said telescopically interfitting members; and

(g) resilient means disposed within said cover member and normally effective to bias said cover member away from said one member and said locking elements to positions within said housing whereat they are in gripping engagement with said other one of said telescopically interfitting members so as to inhibit movement of said other member in one direction longitudinally relative to said one member.

4,234,152

SEATS FOR CHILDREN

Edward Browse, Burwell, England, assignor to Inventec Licensing BV, De Leersum, Netherlands

Filed Feb. 9, 1979, Ser. No. 10,614

Claims priority, application United Kingdom, Feb. 10, 1978, 5502/78

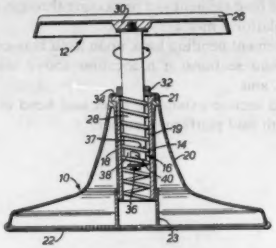
Int. Cl.³ F16M *11/00*; A47C *1/02*; A63G *31/00*

U.S. Cl. 248—415 **12 Claims**

1. A portable child's amusement seat having a base structure, a seat structure, and means for supporting the seat structure on the base structure in overlying relation thereto, wherein the improvement in said supporting means comprises:

a first member connected to the underside of said seat structure and extending vertically downward therefrom towards said base structure; and

co-acting means carried in part by said first member and in part by said base structure for supporting said seat structure over said base structure such that said seat structure



can be raised and lowered relative to said base structure and for causing, in response to the user's weight and/or to the weight of the seat structure, said seat structure to move downwardly and to rotate relative to the said base structure about a vertical axis extending through said seat structure.

4,234,153

DEVICE FOR MOUNTING A MIRROR ON AN AUTOMOBILE PANEL

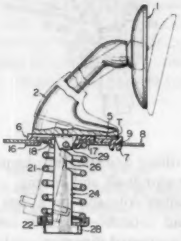
Takeshi Chihara, and Masanori Kono, both of Hiroshima, Japan, assignors to Delta Kogyo Co., Ltd. and Toyo Kogyo Co., Ltd., both of Hiroshima, Japan

Filed May 23, 1979, Ser. No. 41,782

Claims priority, application Japan, May 26, 1978, 53-71993[U]

Int. Cl.³ B60R *27/00*

U.S. Cl. 248—475 B **5 Claims**



1. Device for mounting a mirror on an automobile panel, said device comprising stay means having one end supporting the mirror, stay seat means adapted to be placed on one side of the panel and providing a seat for the other end of the stay means, plate-like support means having means engageable with said panel at the other side thereof, holding lever means having one end removably connected with said other end of the stay means and extending through said stay seat means, said panel and said support means, resilient biasing means between said holding lever means and support means to bias the holding lever means so that the stay means is forced against the stay seat means to hold the stay means on the stay seat means, said engageable means of said support means being in the form of at least one radially outwardly extending lug, said panel having opening means formed with at least one peripheral cut-off adapted for passing said lug therethrough so that the support means can be placed in position by passing it through said opening means in said panel with said lug aligned with the peripheral cut-off in the opening means and rotating it to have

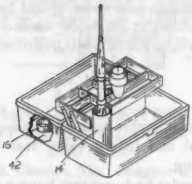
the lug engaged with said other side of the panel, said support means having a retractable finger which is adapted to be engaged with a cut-off formed in said holding lever means so that the holding lever means is temporarily assembled with the support means with the resilient biasing means in compressed condition.

4,234,154

TACKLE BOX ROD HOLDER

Edward A. Walters, 14901 NE. 5 Ct., Apt. 2, N. Miami, Fla. 33161, and James J. Walters, 360 Fiesta Ave., Apt. 214, Jupiter-Tequesta, Fla. 33458

Filed May 21, 1979, Ser. No. 40,885
Int. Cl.[3] A01K *97/10*
U.S. Cl. 248—539 **3 Claims**



1. A tackle box rod holder for tackle boxes having a top surface having an opening and a bottom surface having an opening with the openings being aligned and the surfaces being swingable with respect to another, the tackle box rod holder comprising,

a bifurcated generally cylindrical tubular member having a first portion with a first end fixedly connected to and aligned with the top surface opening and a second open end adapted for connection with a fishing rod when the box is in an open position,

the tubular member including a second portion having a first end connected to the bottom surface and a second open end with the portions being aligned such that a rod may extend comfortably through the member unobstructedly when the box is in the closed position,

thereby when the box is in the open position the second open end of the first portion serves as an open end in which a rod may be inserted when the box is in the open position, and

thereby when the box is in the closed position the bifurcated tubular member extends through the tackle box between the openings in the top and bottom portions without obstructing the swingable relation of the top and bottom portions.

4,234,155

TOOL STAND

Allen L. Destree, 13645 Mukilteo Speedway, Lynnwood, Wash. 98036

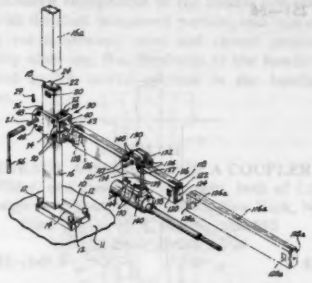
Filed Oct. 19, 1978, Ser. No. 952,916
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—651 **11 Claims**

1. A stand for holding and aligning a tool such as a core drill comprising:

a. base frame means adapted to be secured to a support surface;

b. a first elongate rectangular beam member projecting from and secured to said base frame means said first beam member having a toothed rack thereon extending the length thereof to receive a first drive pinion; and

c. a first carriage means slidably mounted on said first beam member said carriage means comprising (1) first and second side plates, said first and second side plates each carrying opposed spaced apart roller means mounted for rotation about an axis perpendicular to said plates, one of said roller means mounted for movement toward and away from another of said roller means whereby said beam member is captured between said opposed spaced apart roller means, (2) means to vary the distance between said first and second side plates and to lock said first and



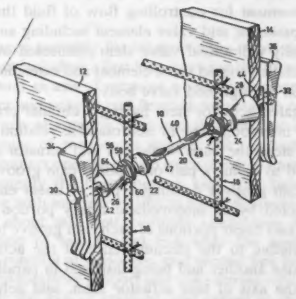
second side plates at a distance apart to receive said column there between (3) a first drive pinion mounted for rotation on an axis perpendicular to the longitudinal axis of said first beam and engaging said rack.

4,234,156

SNAP-TIE

Alfred Wepf, Brampton, Canada, assignor to Acrow-Richmond Limited, Rexdale, Canada

Continuation-in-part of Ser. No. 34, Jan. 2, 1979, abandoned. This application Apr. 24, 1979, Ser. No. 32,811
Int. Cl.[3] E04G *9/00, 17/06*
U.S. Cl. 249—40 **15 Claims**



1. A tie bar for use with forms for forming a wall of a pourable, settable material comprising a bar and two moulded members;

said bar including two stress concentrating notches, a central portion between said two stress concentrating notches and two end portions,

said wherein said moulded members are moulded to said central portion of said bar and comprise a body portion and a flange portion extending radially outwardly from said body portion whereby reinforcing rod may be positioned against said body portion and said flange portion,

said tie bar comprising two moulded spacer portions each having a flat distal facing surface adapted to bear against one of said forms and to positively locate said form with respect to said tie bar;

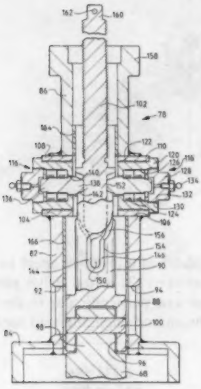
said spacer portions and moulded members together positively locating a reinforcing rod positioned against said body and flange portion with respect to the surface of said wall.

4,234,157

LIFT-TURN VALVE AND ACTUATOR ASSEMBLY

Herbert H. Hodgeman, and Syed S. Ali, both of Houston, Tex., assignors to Daniel Valve Company, Houston, Tex.

Filed Jul. 20, 1978, Ser. No. 926,283
Int. Cl.[3] F16K *31/528, 31/00*
U.S. Cl. 251—56 28 Claims



1. A valve mechanism for controlling the flow of fluid, said valve mechanism comprising:

a valve body structure defining a valve chamber and inlet and outlet flow passages intersecting said valve chamber;

a valve element being located within said valve chamber and being movable with both axial and rotatable components of movement for controlling flow of fluid through said flow passages; said valve element including an elongated generally cylindrical valve stem connected in nonrotatable relation to said valve element and extending in sealed relation through said valve body;

an elongated actuator stem having a circular cross section being interconnected in nonrotatable relation with said valve stem, the outer surface of said actuator stem being formed to define a pair of opposed cam grooves each of said cam grooves defining a pair of linear end portions connected by an intermediate rotary portion of helical form, said linear portions of each cam groove being offset 90° relative to the circumference of the actuator stem from one another and being disposed in parallel relation with the axis of said actuator stem, said actuator stem defining cam surfaces along at least a portion of the sides of said cam grooves;

actuator housing means being connected to said valve body and defining an elongated passage through which said elongated actuator stem means extends;

a pair of opposed cam follower elements being rotatably supported by said actuator housing means and being positioned on opposite sides of said actuator stem, said cam follower means having cam engaging portions thereof extending within respective ones of said cam grooves, said cam follower elements reacting with said cam surfaces of at least the intermediate rotary portions of said opposed cam groove means to induce 90° rotary movement of said actuator stem, valve stem and valve element when said actuator stem is reciprocated; and

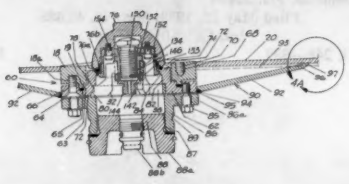
means for imparting linear reciprocal movement to said actuator stem means and allowing rotary movement of said actuator stem means responsive to interaction between said cam follower elements and said helical rotary portions of said cam grooves.

4,234,158

COMBINATION TANK CAR VALVE SKID AND VALVE SEAT WHEREIN THE SKID IS WELDED TO THE VALVE SEAT

Dallas W. Rollins; Gunter R. Behle, both of St. Charles, and Charles E. Reedy, Bridgeton, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 860,987, Dec. 15, 1977, Pat. No. 4,184,663.
This application Jul. 16, 1979, Ser. No. 57,870
Int. Cl.[3] F16K *35/00;* B61D *5/00*
U.S. Cl. 251—144 8 Claims



1. In a bottom operable tank car lading valve assembly a combination skid and lading valve seat for a lading valve closure comprising:

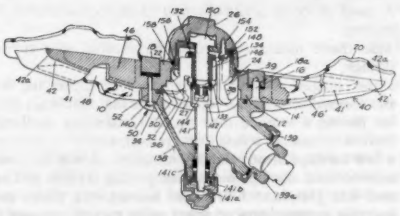
a generally annular body portion having fastening means for attaching the combination skid and valve seat to a tank car universal flange; a generally cylindrical portion extending inwardly and upwardly from said body portion having an opening for lading flow therethrough and including a valve seat for a valve closure; a skid portion welded to said body portion extending longitudinally outwardly from said body portion and abutting the tank bottom at the end portion thereof; the vertical extent of said skid portion decreasing as said skid portion extends outwardly from said universal flange to define a tapered lower skid portion, said fastening means maintaining said skid portion secured in a protective relation without attachment of said skid portion directly to the tank bottom; whereby said skid portion protects said lading valve seat against impacts which might normally cause unseating of the valve closure and escape of the lading in the absence of the skid portion.

4,234,159

COMBINATION TANK CAR VALVE SKID AND VALVE SEAT IN WHICH END PORTIONS ON THE SKID ARE ATTACHED TO THE TANK WITH FASTENERS WHICH DO NOT REQUIRE STRESS RELIEVING OF THE TANK

Dallas W. Rollins; Gunter R. Behle, both of St. Charles, and Charles E. Reedy, Bridgeton, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 860,987, Dec. 15, 1977, Pat. No. 4,184,663.
This application Jul. 16, 1979, Ser. No. 58,217
Int. Cl.[3] F16K *35/00;* B61D *5/00*
U.S. Cl. 251—144 20 Claims



1. In a bottom operable tank car lading valve assembly a

combination skid and lading valve seat for a lading valve closure comprising:

a generally annular body portion having first fastening means for attaching the combination skid and valve seat to a tank car universal flange; a generally cylindrical portion extending inwardly and upwardly from said body portion having an opening for lading flow therethrough and including a valve seat for a valve closure; a skid portion integral with said cylindrical portion and said body portion extending longitudinally outwardly from said body portion and abutting the tank bottom at the end portion thereof; the vertical extent of said skid portion decreasing as said skid portion extends outwardly from said universal flange to define a tapered lower skid portion; skid portion fastening means attaching said skid portion to said tank bottom which do not require stress relieving of the tank body; whereby said skid portion protects said lading valve closure and said lading valve seat against impacts which might normally cause unseating of the valve closure and escape of the lading in the absence of the skid portion.

4,234,160

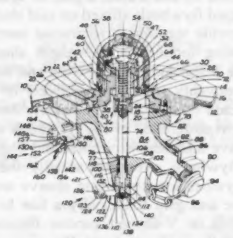
OPERATING HANDLE FOR BOTTOM OPERATED TANK CAR VALVE HAVING MOVABLE CONNECTION PORTION

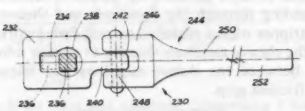
Gunter R. Behle, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 955,966, Oct. 30, 1978. This application Jan. 14, 1980, Ser. No. 112,040

Int. Cl.³ F16K *35/02*

U.S. Cl. 251—144 **8 Claims**





1. In a railway tank car bottom outlet lading valve assembly, an operating handle assembly for the lading valve comprising:

an operating shaft extending vertically within a lading outlet chamber having a non-round shaft tool connection portion near the bottom thereof; an operating handle pivotably mounted on the outlet chamber adjacent said shaft non-round connection portion; said operating handle including a handle connection slot; said connection portion including a curved portion of larger transverse dimensions than said non-round shaft portion; and a non-round connection portion having transverse dimensions adapted to engage said shaft non-round portion; handle support means supporting said handle connection portion for lateral movement relative to said shaft connection portion between an engaged and a disengaged position; in said engaged position said handle non-round portion engaging said shaft non-round portion; and in said disengaged position, said curved slot portion surrounding said shaft engagement portion; a handle-storing bracket for the distal end of the operating handle mounted above said non-round shaft portion adjacent the tank car bottom; removable means for maintaining the distal end of said handle within said bracket, whereby said handle may be pivoted to a generally horizontal position to rotate the shaft through engagement of the handle non-round portion with the shaft non-round portion, and thus move the lading valve between open and closed positions, and whereby after use, the distal end of the handle may be returned to the stored position in the handle-storing bracket.

4,234,161

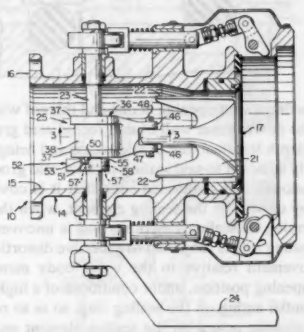
LINKAGE ASSEMBLY FOR A COUPLER

Paul R. Wilder, and David A. Oberrecht, both of Cincinnati, Ohio, assignors to Dover Corporation, New York, N.Y.

Filed Dec. 6, 1978, Ser. No. 966,852

Int. Cl.² F16L *29/00, 37/28*

U.S. Cl. 251—149.9 **13 Claims**



1. A linkage assembly for transmitting a rotary input into a linear output including a first link receiving the rotary input for rotation about an axis of rotation, a yoke, first means to pivotally connect said yoke to said first link for rotation of said yoke about the axis of rotation with said first link for a predetermined amount of rotation, a second link, second means to pivotally connect one end of said second link to linear movable means to supply the linear output, said yoke having means cooperating with said second link to transmit pivotal motion of said yoke about said first pivotally connecting means into linear motion of said second link after the predetermined amount of rotation of said yoke, said second link having bearing means to rotatably support said yoke during rotation of said yoke about the axis of rotation, and means to maintain the center of said bearing means of said second link aligned with the axis of rotation substantially throughout the predetermined amount of rotation of said yoke about the axis of rotation with said first link.

4,234,162

VALVES FOR THE CONTROL OF PRESSURE FLUID

Francis X. Kay, The School House, Addington, Buckinghamshire, England

Filed Apr. 11, 1978, Ser. No. 895,445

Claims priority, application United Kingdom, Apr. 18, 1977, 16077/77

Int. Cl.³ F16K *11/07, 3/24*

U.S. Cl. 251—175 **7 Claims**

1. A pressure fluid control valve, comprising:

(a) a valve body member having ports therein;

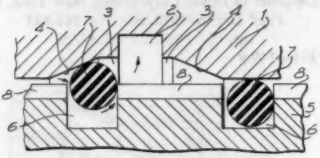
(b) a mobile valve control member movable relative to the valve body member between a port-closing position and port-opening position to control communication between the ports in the valve body member,

(1) one of said members defining a recess having an upstream wall and a downstream wall, and

(2) the other member having a sealing surface facing the recess;

(c) a seal including a sealing element floatingly housed in the recess, said sealing element, sealing surface and recess being dimensioned and positioned such that said sealing element is deformed into sealing engagement with one of the recess walls and with the sealing surface, in the port-closing position of the mobile valve control member, solely by fluid pressure acting on the sealing element; and

(d) a recess vent comprising at least one longitudinal groove formed on the surface of said member defining a recess



and having a vent opening at one end thereof which opens into the downstream wall of said recess, said groove having a depth less than that of said recess and being disposed directly adjacent to said sealing surface, said groove being dimensioned and positioned such that it is covered, and thereby closed, by the sealing element, when the latter is performing its sealing functions, and is uncovered when said sealing ring is subjected to excessive distortion during its movement relative to the valve body member to a port-opening position, under conditions of a high pressure differential acting on the sealing ring, so as to relieve the fluid pressure acting on the sealing element and causing the excessive deformation thereof.

4,234,163

ENGAGEMENT DEVICES

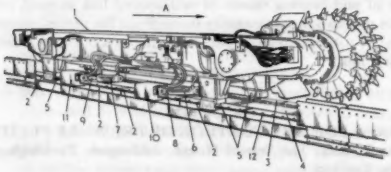
Miltiades Kormendy, Rolleston-on-Dove, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Mar. 3, 1978, Ser. No. 883,105

Claims priority, application United Kingdom, Mar. 15, 1977, 10836/77

Int. Cl.³ B66F 1/04

U.S. Cl. 254—108 **22 Claims**



1. An engagement device to be used in a ram-driven chainless haulage system including a driving ram and spaced apart abutment portions on a track, the device comprising a movably mounted abutment and a pivotally mounted double acting locking ram, operable to move the abutment into and out of engagement with consecutive abutment portions of the track, and a plate located on the side of the track remote from the locking ram to act as a limiting means to prevent the abutment from protruding too far through any of abutment portions in the track.

4,234,164

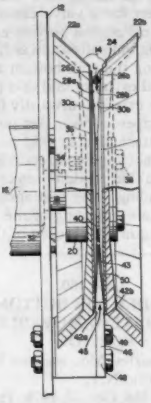
LINE HAULER FOR CRAB POTS AND THE LIKE

Joseph S. Ruark, Rte. 3, Box 233, Cambridge, Md. 21613

Filed Jul. 28, 1978, Ser. No. 928,908

Int. Cl.³ A01K 73/06

U.S. Cl. 254—371 **9 Claims**



1. A crab pot hauling system comprising in combination, a frame, a drive motor, a shaft drivably coupled to the motor and rotatably supported by the frame, a pair of spaced generally cylindrically shaped flywheels affixed on said shaft for rotation therewith to provide significant rotational inertia, a pair of spaced line hauling inclined light weight sheave members having a disc-like shape and made of wear and corrosion resistant material removably affixed respectively to and between said flywheels, each of said sheave members having an outer rim within the circumference of the flywheels and such that each of said sheave members is circular and engages an inner surface of the flywheels over substantially the entire inner surface of the flywheels, each of said sheave members being spaced to receive and grip frictionally a line between an inwardly converging or V-shaped groove therebetween at a position substantially midway from the outer rim of each sheave member to the shaft to impart a hauling tension to the line, mounting means holding the flywheels and sheave members in fixed relative position for common rotation with the shaft extending through the flywheels and sheave members, and line stripper means mounted on said framework extending between the sheave members thereby to engage a line frictionally held between the sheave members and release the line from the friction grip.

4,234,165

LUMINAIRE LOWERING DEVICE

Omer E. Murray, and Richard L. Thompson, both of Hendersonville, N.C., assignors to General Electric Company, Schenectady, N.Y.

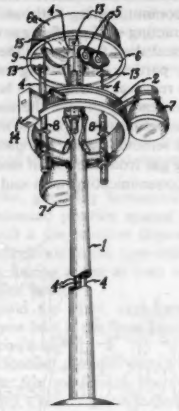
Filed Aug. 4, 1978, Ser. No. 931,081

Int. Cl.³ B66C 23/60

U.S. Cl. 248—404 **8 Claims**

1. Hoist apparatus comprising, in combination, a hollow pole, cable guide means secured at the top of said pole, load support means movable between the top and bottom of said pole, winch means at the lower end of said pole for raising and lowering said load support means on said pole, a winch cable associated with said winch means and having a free end, a plurality of hoist cables passing around said cable guide means and each connected at one end to said load support means in spaced relation to the other hoist cables, said hoist cables extending at their other ends into said hollow pole, transition plate means arranged in said pole, and a plurality of freely

rotatable thrust bearing means respectively securing said other ends of said hoist cables and said free end of said winch cable to said transition plate means, so that said cable ends are individually freely rotatable relative to said transition plate means, whereby twisting and tangling of said hoist and winch cables during raising and lowering of said load support means are avoided.

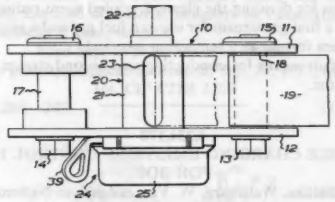


4,234,166

CLUTCHED WINCH

Claes A. Cederblad, Skanör, Sweden, assignor to Spanset Inter AG, Basel, Switzerland

Filed Aug. 4, 1978, Ser. No. 931,096
Claims priority, application Sweden, Aug. 11, 1977, 7709084
Int. Cl.³ A63B *61/04*; B60P *7/06*; B61D *45/00*; B65D *63/10*
U.S. Cl. 24—68 CD **4 Claims**



1. A winch for lines and webbing, comprising a frame consisting of two plates spaced from each other,

cross-pieces between said plates, one of said cross-pieces forming means for anchoring said frame to a stationary object, and another of said cross-pieces forming means for anchoring one end of a line,

a winding roller rotatably journalled in said frame having a line securing portion thereon,

a housing on said frame fixedly mounted to one of said plates, and

a ratchet mechanism for said winding roller disposed in said housing,

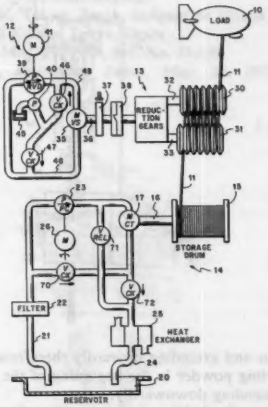
said ratchet mechanism comprising two ratchet disks concentric with said winding roller and in abutment with each other, one of said disks being rigidly connected to said winding roller and the other being axially movably journalled in said housing against the action of a spring, ridges which are saw-toothed shaped in cross-section on the sides of said ratchet disks facing each other having radial locking surfaces thereon, a clutch ring rotatably journalled in said housing between said ratchet disks, said ring having clutch portions directed towards its center and there is provided wedge-shaped portions along the periphery of said axially movable disk, said clutch portions being shiftable into engagement with said wedge-shaped portions by the rotation of said clutch ring for shifting of said axially movable disk against the action of said spring such that the locking surfaces of said disks are disengaged from each other, and an operating arm connected to said clutch ring and projecting from said housing adjacent the outwardly facing side of said one plate.

4,234,167

AUTOMATIC INHAUL WINCH SYSTEM

William C. Lane, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 18, 1978, Ser. No. 934,797
Int. Cl.³ B66D *1/76*
U.S. Cl. 254—291 **8 Claims**



1. An improved winch system for paying out and retrieving a flexible line attached to a load having a traction unit and a spooling unit, wherein the improvement comprises:

a. means for operating said spooling unit to impose tension on said flexible line;

b. means for driving said traction unit to control the pay out and retrieve said flexible line; and

c. an overrunning clutch means installed within said driving means and transmitting torque from said driving means in only one direction to retrieve said flexible line whereby said spooling unit can retrieve said flexible line when said load on said flexible line is less than said tension imposed by said operating means.

4,234,168

APPARATUS FOR PRODUCING LOW-OXYGEN IRON-BASE METALLIC POWDER

Yoshihiro Kajinaga; Minoru Nitta, both of Chiba; Ichio Sakurada, Ichihara, and Shunji Ito, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 775,924, Mar. 9, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,374
Claims priority, application Japan, Mar. 12, 1976, 51-26708
Int. Cl.³ C21D *1/40, 1/42*
U.S. Cl. 266—128 **4 Claims**

1. An apparatus of vertical type for producing low-oxygen iron-base metallic powder, which comprises

(a) means for feeding a starting powder composed of iron-bae metallic raw powder to be subjected to a final reduction, which has an apparent density in filled state corresponding to 16–57% of theoretical true density, an oxygen

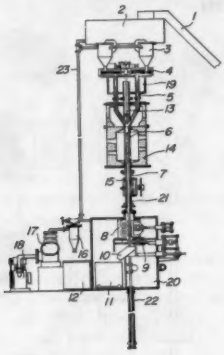
content of not more than 6% by weight and a particle size of not more than 1 mm, and carbon and/or carbonaceous granule to be alloyed in and/or admixed with the iron-based metallic raw powder in an amount corresponding to not more than a target alloying carbon content of a final product (% by weight)+an oxygen content of the powder just before the final reduction (% by weight)×1.35,

(b) a preheating a sintering device for preheating the starting powder from the feeding means to form a preheated and sintered cake,

(c) an induction heating device for subjecting the preheated and sintered cake to the final reduction by induction heating to form an induction heated cake,

(d) a pushing member for transferring the starting powder downwardly from the feeding means to the preheating and sintering device,

(e) a dummy bar, housed in the bottom portion of said appa-



ratus and extending upwardly therefrom for holding the starting powder in the beginning of the operation, while descending downwardly,

(f) means for holding and descending the induction heated cake,

(g) a synchronous device for synchronizing the dummy bar with the pushing member,

(h) means for adjusting and maintaining at least interiors of the preheating and sintering device and the induction heating device in a non-oxidizing atmosphere having a thermodynamically calculated oxygen partial pressure of not more than 2.1×10^{-1} mmHg and a dew point of not more than +5° C.,

(i) means for cutting the induction heated cake, into a predetermined length,

(j) means for cooling the cut cake, and

(k) means for pulverizing the cooled cake, so as to obtain low-oxygen iron-base metallic powder.

4,234,169

APPARATUS FOR THE DIRECT REDUCTION OF IRON AND PRODUCTION OF FUEL GAS USING GAS FROM COAL

John C. Scarlett, Toledo, Ohio, and Donald Beggs, Charlotte, N.C., assignors to Midrex Corporation, Charlotte, N.C.

Division of Ser. No. 967,348, Dec. 7, 1978, which is a continuation-in-part of Ser. No. 933,690, Aug. 15, 1978. This application Sep. 24, 1979, Ser. No. 78,537

Int. Cl.³ F27B 1/08

U.S. Cl. 266—156 **4 Claims**

1. Apparatus for the direct reduction of iron oxide and production of fuel gas comprising:

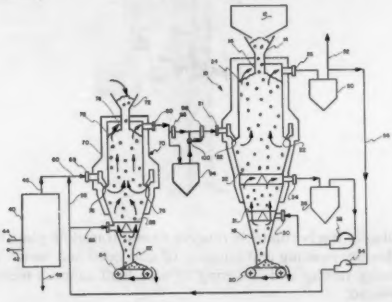
a. a fossil fuel gasifier for producing a gasifier gas;

b. a generally vertically shaft type reactor having means at its upper end for introducing a particulate burden thereto and means for removing particulate material therefrom at its lower end, means intermediate said burden introducing and removal means for introducing gas from said gasifier to the burden in said reactor and means for removing treated gas from said reactor above said burden;

c. conduit means communicating with said gasifier and said reactor for conducting said gasifier gas to said reactor;

d. a generally vertical shaft furnace for the direct reduction of iron, having particle introducing means at the top thereof, particle removal means at the bottom thereof for establishing a descending burden therein, treated gas introduction means between said particle introducing means and said particle removal means and means for removing a spent reducing gas from the top of said furnace;

e. conduit means communicating with said reactor and said furnace;



f. means associated with said conduit for separating said treated gas from said reactor into two streams;

g. means for cooling one of said streams;

h. temperature responsive valve means for introducing said cooler stream to the hotter stream in said conduit between said reactor and said furnace;

i. means communicating with said spent gas removal means for cooling and scrubbing said removed spent reducing gas;

j. means for dividing the cleaned, cooled spent reducing gas into a first gas stream for use as a fuel gas and a second gas stream for use as a tempering gas; and

k. conduit means for conducting said second stream to said reactor.

4,234,170

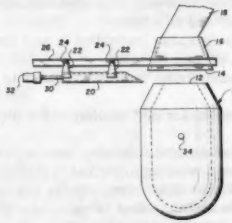
MOVABLE CHARGING EMISSIONS CONTROL HOOD FOR BOF

John R. Suitlas, Wellsburg, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Jun. 6, 1979, Ser. No. 46,034

Int. Cl.² C21C 5/40

U.S. Cl. 266—158 **30 Claims**



1. In a metallurgical processing system including a converter vessel having a charging opening at its upper end and being mounted for rotation about a substantially horizontal axis

between an upright refining position in which the charging opening is disposed in a substantially horizontal plane at the top of the vessel and a charging position in which the charging opening is displaced laterally and inclined with respect to its refining position, and a fixed gas collection hood mounted above the converter vessel and having an open inlet disposed in spaced, substantially concentric opposed relation with the charging opening in its refining position, the improvement comprising,

movable hood means associated with the fixed hood for capturing emissions discharged from the converter vessel in the charging position and directing the emissions into the open inlet of the fixed hood, the movable hood means including,

a substantially flat, generally horizontal top plate movable between a retracted position spaced laterally from said fixed hood and a use position disposed beneath and in closely spaced relation to the open inlet of the fixed hood, said top plate having a size at least as great as the open inlet in the fixed hood,

an opening in said top plate, said opening being located beneath the open inlet in the fixed hood when the top plate is in the use position,

downwardly extending sidewall means rigidly mounted on said top plate for movement therewith, said sidewall means including a pair of plates mounted one on each side of said top plate means in position to extend adjacent the sides of the converter vessel at the top thereof when the movable hood is in the use position and the converter vessel is in the charging position, and

sealing plate means for engaging the outer surface of said converter vessel on the side thereof opposite the direction to which the charging opening is tilted and cooperating with said converter vessel wall, said sidewall means and said top wall for effectively preventing ambient air from entering said fixed hood from the side of the converter vessel opposite the charging opening when the converter vessel is in the charging position.

4,234,171

MIXING ARRANGEMENT

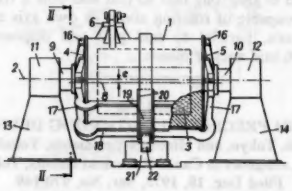
Alexander Patuzzi, Linz; Ernst Riegler, Enns, and Manfred Schmidt, Linz, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 5, 1978, Ser. No. 939,885

Claims priority, application Austria, Sep. 29, 1977, 6936/77

Int. Cl.³ C21B *3/00*

U.S. Cl. 266—248 **12 Claims**



1. In a mixing arrangement of the type including: a fixed base; a tiltable large-space pig iron mixer provided with a refractory lining and having a cylindrical mixing chamber of about 10 to 15 meters in diameter, said cylindrical mixing chamber being horizontally arranged and having opposite end walls and a cylindrical jacket; and bearing means including a fixed bearing and an expansion bearing supporting said cylindrical mixing chamber, the improvement comprising:

two aligning carrying trunnions with first and second ends, each trunnion having its first end fixedly connected to a respective one of said end walls so as to be secured against rotation relative to said end walls, one of said two aligning carrying trunnions having its second end rotatably mounted in said fixed bearing, which is mounted on said fixed base, and the other of said aligning carrying trunnions having its second end rotatably mounted in said expansion bearing, which is mounted on said fixed base, so as to support said cylindrical mixing chamber on said fixed base;

reinforcement ribs provided at said end walls and extending from said aligning carrying trunnions radially to the periphery of said cylindrical mixing chamber; and

longitudinal ribs extending along the jacket of said cylindrical mixing chamber parallel to its axis and connecting at least some of said reinforcement ribs arranged on opposite end walls to form a supporting cage for said cylindrical mixing chamber.

4,234,172

HYDRAULIC SHOCK ABSORBER AND SPRING COMBINATION

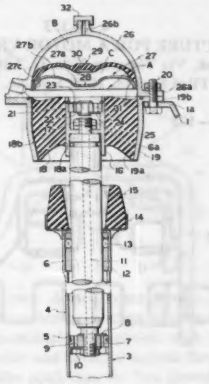
Noriyuki Takahashi, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 22,438

Claims priority, application Japan, Mar. 23, 1978, 53-37258[U]

Int. Cl.³ F16F *13/00*

U.S. Cl. 267—8 R **7 Claims**



1. A hydraulic shock absorber for use on vehicles, comprising:

a cylinder supported adjacent a wheel of the vehicle;

a piston slidably disposed in said cylinder;

a rod connected at the lower end thereof with said piston;

an elastic attachment having a central portion and an outer portion;

said elastic attachment being connected at an inner peripheral surface of said central portion thereof to the upper end of said rod, and at an outer peripheral surface of said outer portion thereof to an annular holder, said annular holder being connected to a vehicle body portion;

a cap sealingly covering said elastic attachment to define a sealed chamber between said elastic attachment and said cap;

a substantially rigid partition disposed in said chamber above said elastic attachment, said partition being provided with a communicating hole;

a flexible membrane disposed above said partition in said chamber to define a first substantially sealed compartment between said membrane and said cap and a second substantially sealed compartment between said membrane and said elastic attachment, said first and second compartments being sealed from each other by said flexible membrane;

said rod being provided with an axial passage therethrough which interconnects opposite sides of said partition through said communicating hole in said second compartment of said sealed chamber with said cylinder;

said second compartment of said sealed chamber, said axial passage, and said cylinder being adapted to be filled with oil which contacts said elastic body within said sealed chamber;

said first compartment of said sealed chamber being filled with pressurized gas; and

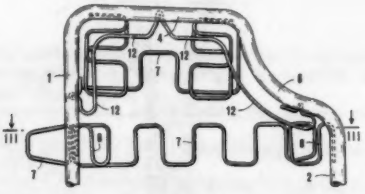
said membrane being movable in response to hydraulic pressure build-up in said second compartment, against the gas pressure in said first compartment, whereby a secondary dampening effect between the vehicle body and said shock absorber is provided by the springing action of gas pressure within said first compartment against said flexible membrane.

4,234,173

STRUCTURE FOR A MOTOR VEHICLE SEAT

Luigi Brandoli, Via Vincenzo Vela 32, I-10.128 Turin, Italy

Filed Sep. 14, 1978, Ser. No. 942,352
Int. Cl.³ A47C 7/28
U.S. Cl. 267—103 **1 Claim**



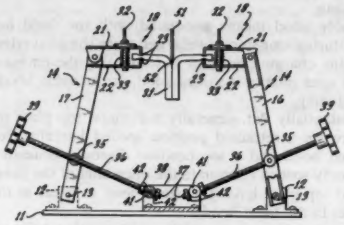
1. A structure for a motor vehicle seat, comprising a perimetrical frame made of a metal tube, a plurality of springing elements disposed between and secured at their ends to opposite portions of said perimetrical frame, each said springing element having near but spaced from each end a cross member situated at a level below the upper limit plane of the perimetrical frame, and wire rods fixed to said perimetrical frame and situated substantially at the same level as said cross members, said cross members of the springing elements and said wire rods providing a complete set of anchorage points for the upholstery of the seat substantially entirely about said frame, said frame having relatively long front and rear sides and relatively short ends, said springing elements extending between said front and rear sides comprising said opposite portions, said wire rods being disposed only adjacent said ends, said wire rods each being secured to said frame at a plurality of points spaced about the frame only adjacent the ends of the frame, said wire rods extending adjacent but spaced from and in general parallelism with said ends of said frame between said spaced points of securement of said wire rods, each said wire rod being only secured to said frame adjacent the ends of the wire rod and at a point intermediate the ends of the wire rods, the points of securement of each wire rod to the frame being on portions of the frame that are out of parallelism to each other, said wire rod being bent double to form said intermediate point of securement.

4,234,174

APPARATUS FOR AIDING THE CUTTING OF A RUBBER MOLD

Angelo Cardono, 11114 New St., Downey, Calif. 90241

Filed May 7, 1979, Ser. No. 36,775
Int. Cl.³ B25B 1/20
U.S. Cl. 269—37 **2 Claims**



1. An apparatus for working on a workpiece comprised of:

a base;

a pair of arms;

a pair of blocks mounted on said base in spaced apart relationship;

each of said blocks having a bore and said bores are disposed parallel to each other;

each of said arms comprising of two spaced-apart parallel channels;

one of said blocks being disposed between said two spaced apart channels of a respective one of said arms;

a pin disposed through each one of said bores in said blocks and through said two spaced apart channels of said respective one of said arms so that said arms rotate with respect to said base and substantially in the same plane;

a jaw being pivotably mounted between the channels of each respective one of said arms;

a nut member rotatably mounted between the channels of a respective one of said arms and between said block and said jaw;

said nut member having a threaded hole formed therein disposed at right angles to the axis of rotation of said nut member;

a long bolt threaded through a respective one of said nut member;

anchor means disposed between said blocks for engaging one end of said long bolt so that said bolt is fixed axially and is capable of rotating about its own axis and on another axis, parallel to said pins and disposed passing through said anchor means.

4,234,175

HIGH PRECISION POSITIONING DEVICE

Hiroshi Sato, Tokyo, and Hironori Yamamoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1978, Ser. No. 970,149
Claims priority, application Japan, Dec. 20, 1977, 52-154170
Int. Cl.³ B23Q 1/02
U.S. Cl. 269—73 **2 Claims**

1. A device for effecting high precision positioning with respect to two directions orthogonal to each other in a plane, comprising:

a first guide member for guiding a first guided member in a first direction;

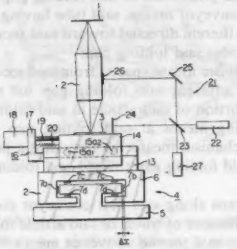
a first gas bearing for floatingly supporting said first guided member relative to said first guide member;

a second guide member secured to said first guided member for guiding a second guided member in a second direction perpendicular to said first direction;

a second gas bearing for floatingly supporting said second guided member relative to said second guide member;

a mechanism for relatively roughly moving said first guided member in the first direction along said first guide member;

means for changing and adjusting the gas pressure of a part of said first gas bearing which part defines a floated position, in the second direction, of said first guided member to relatively finely change and adjust its position in said second direction;



a mechanism for relatively roughly moving said second guided member in the second direction along said second guide member; and

means for changing and adjusting the gas pressure of a part of said second gas bearing which part defines a floated position, in the first direction, of said second guided member to relatively finely change and adjust its position in said first direction.

4,234,176

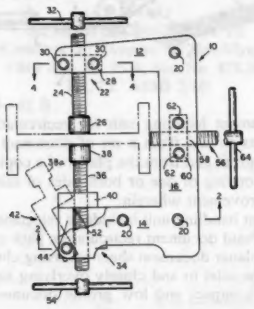
QUICK RELEASE CLAMP

Otis W. Goff, 5221 Woodmont Dr., Kalamazoo, Mich. 49001, and Melvin J. Goff, 2454 52nd, SW, Wyoming, Mich. 49509

Filed Aug. 17, 1979, Ser. No. 67,621

Int. Cl.³ B25B *1/10*

U.S. Cl. 269—156 **7 Claims**



1. A quick release clamp comprising

a base member having an upstanding arm unitary therewith,

a clamping face associated with said arm,

screw actuated, clamping means projecting from said upstanding arm to said clamping face, holding means for holding a work piece in a position apposed to said clamping face, said clamping means, in the clamping position, being aligned in a centerline essentially normal to said arm and being operative to move said clamping face toward clamping position and to apply pressure to a said work piece, and

quick release means associated with said clamping means operative to move said clamping face from its normal position to a position in which it is no longer apposed to the work piece and said clamping means is no longer aligned with said work piece, in which said quick release means comprises a pivoted block into which said screw actuated clamping means is threaded, whereby, when said block is rotated about its pivot, said clamping means and said clamping face will be swung out of alignment with the work piece, and in which said pivoted block is L-shaped, in which said screw actuated clamping means is threaded into the short leg of the L, in which the long leg is pivoted adjacent its end, and in which in the aligned position, the short leg abuts the inner side of said arm, whereby the pressure engendered by tightening up said clamping means is transferred through said short leg to the arm on which it abuts, and the bight of said L is so positioned relative to the bottom of the arm to which the block is pivoted, that on rotation of the block about its pivot, the short leg is rotated out of abutment with the inner face of said arm.

4,234,177

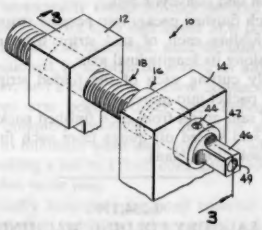
DIFFERENTIAL SCREW DEVICE FOR WORKHOLDERS AND THE LIKE

Thomas F. McDougal, 1415 Beech La., Fairmont, W. Va. 26554

Continuation of Ser. No. 869,294, Jan. 13, 1978, abandoned. This application Apr. 9, 1979, Ser. No. 28,926

Int. Cl.³ B25B *1/10*

U.S. Cl. 269—241 **4 Claims**



1. A differential screw device comprising a first member having a threaded bore therein, a screw spindle having a first threaded portion threadingly engageable with the threaded bore in the first member and having a second threaded portion with threads of smaller pitch than the first threaded portion, a second member having a threaded bore therein, threadingly engageable with the second threaded portion of the spindle, a torsion spring fixed at one end to the screw spindle and fixed at the opposite end thereof to the second member, and means for rotating said second member relative to said first member, said screw spindle having a bore extending axially and opening at the end of the screw spindle having the second threaded portion and said torsion spring being a coil spring of diameter slightly less than the bore in the screw spindle and is mounted on said bore.

4,234,178

PROCESS AND APPARATUS FOR THE PRODUCTION OF BOOK BLOCKS

Alexander Beckert, Vienna, Austria, and Ernst Dudziak, Harsewinkel, Fed. Rep. of Germany, assignors to Reinhard Mohn GmbH, Gutersloh, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 940,978

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741332

Int. Cl.³ B42C *1/00*

U.S. Cl. 270—45 **22 Claims**

1. Process for production of book blocks of printed sheets comprising:

providing a plurality of stacks of printed sheets in series, one

after another, alongside a continuously running, transversely inclined conveyor belt;

successively feeding one sheet from each stack, one upon another, to form a sheet packet on said conveyor belt, each sheet firstly being fed at a downwardly inclined angle from its stack and in a transverse direction to the running direction of said conveyor belt, and each sheet secondly being accelerated in the running direction of said conveyor belt to obtain same speed as said conveyor belt with a first of the sheets being deposited on said conveyor belt and successive sheets being deposited on a previously deposited sheet to provide the packet, each sheet being downwardly inclined toward said conveyor belt during acceleration and before depositing thereof on said conveyor belt;

continuously forming sheet packets on said conveyor belt so that a finished packet is disposed at one end of said conveyor belt when another packet is first starting to be formed at an opposite end of said conveyor belt, with a number of unfinished packets being disposed therebetween on said conveyor belt;

cutting each finished packet into parallel strips;

centrally folding each of said strips from each finished packet along its longitudinal axis;

transversely cutting each of the folded strips from each finished packet into quires;

scaling off said quires from each finished packet; and

gathering said scaled off quires from each finished packet into a book block blank.

4,234,179

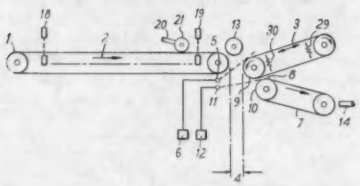
LAUNDRY FOLDING MACHINE

Henry J. Weir, "Alta Vista", 2, Knapton Rd., Monkstown, Dublin, Ireland

Continuation of Ser. No. 779,228, Mar. 18, 1977, abandoned. This application Apr. 17, 1979, Ser. No. 30,874

Int. Cl.³ B65H *45/14*

U.S. Cl. 493—14 **12 Claims**



1. A folding machine for folding a flat article having leading and trailing edges, said machine comprising:

first conveyor means for carrying an article to be folded in a forward direction;

second conveyor means, adjacent and spaced from said first conveyor means by a space, for receiving the leading edge of said article carried on said first conveyor means and carrying said article in the same direction as said first conveyor means, for halting the movement of said leading edge for a predetermined period of time, and for reversing the direction of travel of said leading edge following said halt in movement thereof into said space between said first and second conveyor means;

said space between said first and second conveyor means being a folding gap;

first bridging means at said folding gap for controlling the movement of said article through said folding gap toward said second conveyor means, said first bridging means comprising:

a high pressure air source, and

a hollow lateral tube connected to said high pressure air source and positioned at said folding gap opposite said second conveyor means, said tube having a plurality of openings therein directed toward said second conveyor means across said folding gap;

folding mechanism means spaced from said second conveyor means and adjacent said folding gap for receiving and folding a portion of said article in said folding gap;

second bridging means at said folding gap opposite said folding mechanism means for directing a portion of said article in said folding gap toward said folding mechanism means; and

measuring means along said first conveyor means for measuring the distance of travel of said article therealong, and connected to said second conveyor means for controlling the forward movement, halting and rearward movement thereof in relation to the length of travel of said article on said first conveyor means, and connected to said bridging means and said folding mechanism means for controlling the operation thereof in accordance with the length of travel of the article on said first conveyor means.

4,234,180

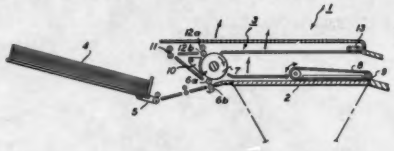
RECIRCULATING DOCUMENT HANDLER CONFIGURATION

John H. Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1979, Ser. No. 52,526

Int. Cl.³ B65H *1/06, 1/30*

U.S. Cl. 271—3.1 **11 Claims**



1. In a document handling unit for recirculating original document sheets to and from a set of document sheets in a recirculation path to and from the platen of a copier for selective repeated copying of one or both sides of said document sheets, the improvement wherein:

said document handling unit includes a selectable document inverter in said document recirculation path comprising a generally planar document sheet reversing chute which is generally parallel to and closely overlying said platen to provide a compact and low profile document handling unit, and

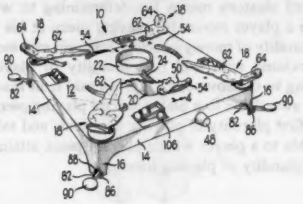
wherein said selectable document inverter further comprises a sheet feeder adjacent a first side of said platen for feeding said document sheets from said platen into and out of said reversing chute from said same first side of said platen to invert document sheets in said document recirculation path after they are copied on said platen and before they are returned to said set of document sheets, and

wherein said selectable document inverter further comprises a selectively positionable document sheet deflector gate adjacent said first side of said platen for selectively bypassing said reversing chute to feed document sheets from said platen directly back to said document set or for alternatively feeding document sheets from said platen into said reversing chute for inversion as they are returned to said document set from said platen.

4,234,181
ROUND-ABOUT GAME APPARATUS

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Sep. 21, 1978, Ser. No. 944,252
Int. Cl.[3] A63F 9/00
U.S. Cl. 273—1 R 13 Claims



1. A round-about game apparatus, comprising:

a housing having a platform defining a playing surface;

a striking element mounted on the platform for movement in a predetermined path of travel including drive means for moving the element along said path;

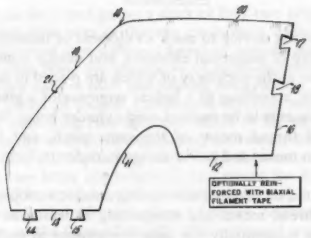
a plurality of playing pieces mounted on the platform in a position with at least a portion of the playing piece lying in a coincident path with the path of travel of said striking element, said playing pieces being mounted for selective movement thereof out of said coincident path of travel; and

a selectively operable, manually variable, actuator associated with each playing piece for variably moving the portion of the playing piece depending on the intensity of manual operation of said actuator from the coincident path of travel with the striking element, upon timely actuation by the player of the game.

4,234,182
LINER FOR DECK CHUTE

Thomas M. Camilleri, 277 Avenue W, Brooklyn, N.Y. 11223

Filed Jan. 30, 1978, Ser. No. 873,382
Int. Cl.[3] A63D 5/00
U.S. Cl. 273—42 R 11 Claims

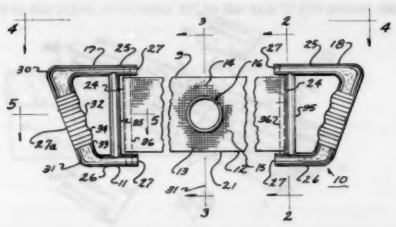


4. A flexible blank adapted to conform to substantially all of the interior surface of a deck chute and to be removably inserted in a deck chute in an automatic pinsetter bowling machine, the blank comprising substantially a planar development of substantially all of the deck chute interior surface to be lined, the blank being formed of a material having a low coefficient of friction with respect to contacting surfaces of a bowling pin, the blank surface contacting the deck chute being provided with a separate, external reinforcing member which imparts strength and resiliency to the lining.

4,234,183
GAME DEVICE

Donald J. Stephens, P.O. Box 630, Roberta, Ga. 31078

Filed Nov. 16, 1978, Ser. No. 961,193
Int. Cl.[2] A63B 65/12
U.S. Cl. 273—318 3 Claims



1. In a game apparatus utilizing a ball, comprising, in combination, a central net portion of generally rectangular outline adapted to catch a ball including relatively short fastener ends and relatively long horizontal edges;

a pair of complementary substantially planar handles adapted to be connected to opposite fastener ends of said net each including a horizontally elongated upper cantilevered arm portion having an inner end and an outer end, a lower horizontally elongated cantilevered arm portion substantially shorter than said upper arm portion having an inner end and an outer end, with the inner ends of said arms positioned in substantially vertical alignment with each other, and a hand grip portion connected fixedly to said upper arm portion outer end, depending downwardly, obliquely inwardly at an angle arranged and adapted to minimize wrist and arm strain when catching and propelling a ball to a fixed connection with said lower arm portion outer end;

and a vertically arranged elongated traverse pin member fixedly attached between said upper and said lower arm member adjacent their inner ends, said pin arcuately bowed centrally in a plane substantially normal to the handle plane to connect the fastener ends of the net in arcuate relationship to said handles.

4,234,184
THERMOPLASTIC POLYMER COVER FOR GOLF BALLS AND GOLF BALLS COMPRISING SUCH A COVER

Gerard Deleens, Bernay; Bernard Guerin, Bures sur Yvette, and Rene Kern, Savigny sur Orge, all of France, assignors to ATO Chimie, Courbevoie, France

Filed Feb. 15, 1979, Ser. No. 12,431
Claims priority, application France, Feb. 24, 1978, 78 05285
Int. Cl.[3] A63B 37/12; C28G 69/44
U.S. Cl. 273—235 R 15 Claims

1. A golf ball having a core and a cover of thermoplastic polymeric material surrounding the core which comprises a thermoplastic polymer material comprising a poly(ether-ester-amide) sequenced copolycondensate obtained from the copolycondensation of an α,ω-dicarboxylic copolyamide having an average molecular weight between 300 and 15,000 with an α,ω-dihydroxyl aliphatic polyoxyalkylene glycol of an average molecular weight between 100 and 6,000, the sequenced copolycondensate containing 5 to 85% by weight of polyoxyalkylene glycol moieties and having a melting point between 80° and 150° C. and a Shore D hardness between 35 and 70.

4,234,185

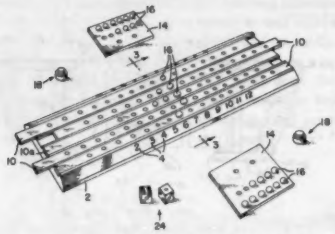
STRATEGY AND PERCEPTION GAME

Bruce F. Alsip, 270 Almak Ct. N.W., Issaquah, Wash. 98027

Filed Jun. 8, 1978, Ser. No. 913,572

Int. Cl.[3] A63F *3/00, 9/00*

U.S. Cl. 273—243 **1 Claim**



1. A game of skill and chance comprising:

a plurality of markers for each player,

a game board having discrete indicia means along the edges thereof and including a plurality of parallel elongated slides mounted upon the board for movement along their length, each of said slides having a row of discrete marker receiving positions corresponding to the discrete indicia means along the line of movement of said slide, said slides being limited in movement only by the fact that during play at least one of the marker receiving positions must be adjacent one of the indicia means, said game board further including at least one stationary line of discrete marker receiving positions,

random selection means having indicia corresponding to the indicia on the board such that each player in turn places a marker at a marker receiving position corresponding to the indicia on the random selection means and moves a slide upon which the marker has been placed one position in either direction and tallies the score by counting adjacent markers.

4,234,186

BOARD GAME

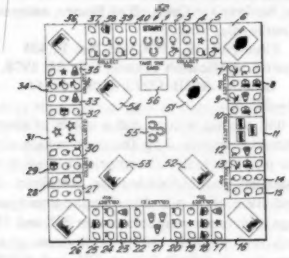
Stanley G. Forrest, and Michael C. Spashett, both of Southampton, England, assignors to Guy Colins Co. Limited, Southampton, England

Filed Aug. 28, 1978, Ser. No. 937,605

Claims priority, application United Kingdom, Feb. 14, 1978, 5864/78

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—243 **7 Claims**



1. Apparatus for playing a game, comprising a plurality of tokens, a board bearing a closed-circuit single-lane track that is sub-divided transversely into a series of playing locations extending around the track, each of a first plurality of said playing locations portraying three fruit machine symbols, said fruit machine symbols being selected from several different fruit machine symbols and adjacent said locations bearing different combinations of said fruit machine symbols, and each of a second plurality of said playing locations portraying one of said tokens, a playing piece for each player, said pieces being movable along said track in accordance with predetermined rules, and aleatory means for determining to which playing location a player moves his playing piece at his turn to play, and a plurality of money symbols, wherein said money symbols are associated with said first plurality of playing locations according to the absence of a given said fruit machine symbol and are awardable to a player whose playing piece attains one of said first plurality of playing locations, and said tokens are awardable to a player whose playing piece attains one of said second plurality of playing locations.

4,234,187

DEVICE FOR MARKING AN ELEMENT OF INFORMATION

Roger Las, 1145 Les Poissons, 92400 Courbevoie, France

Filed Jun. 30, 1978, Ser. No. 921,112

Claims priority, application France, Jul. 8, 1977, 77 21208; Dec. 5, 1977, 77 36566

Int. Cl.[3] A63F *3/00, 9/00*

U.S. Cl. 273—248 **7 Claims**

5. A marking device to mark an element of information out of a plurality of sequential elements, said device comprising:

a cylinder at the periphery of which are placed in successive squares, according to a helical sequence of a given pitch, the elements to be marked, said cylinder being fitted with helical thread means of the same pitch, and including bottom means and cover means in order to form a closed box,

a ring fitted on said cylinder having means to cooperate with said thread means and comprising at least one window having substantially the same dimensions as each of said elements to be marked; whereby, by rotating said ring around said cylinder, said elements to be marked sequentially appear in said window,

said cylinder having an end portion forming part of said closed box and extending axially beyond helical sequence,

at least part of said end portion of said cylinder being made of a translucent material, and at least one individual information-carrying element being freely received within said closed box,

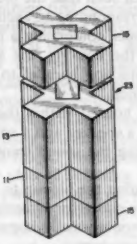
whereby in at least a position of said device said information-carrying element may be seen from the outside.

4,234,188

MODULAR CHESS SET

Robert R. Keegan, 1825 Susan Dr., Fayetteville, Ark. 72701

Filed Nov. 5, 1975, Ser. No. 628,475
Int. Cl.[3] A63F *3/02*
U.S. Cl. 273—290 10 Claims



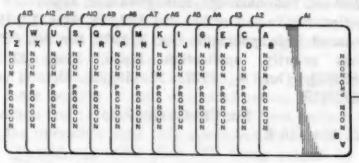
1. A set of game-pieces comprising at least four groups of pieces, the pieces of the first group being of a first configuration having a cruciform, substantially uniform, horizontal cross-section, the pieces of the second group being of a second configuration different from said first configuration and shaped for engagement with a piece of said first configuration, the pieces of the third group being formed of at least two modules having said first and second configurations, and the pieces of said fourth group being formed of at least three modules having said first and second configurations.

4,234,189

EDUCATIONAL PLAYING CARDS

Robert E. Chunn, 1084 Dayton, #301, Aurora, Colo. 80010

Filed Dec. 26, 1978, Ser. No. 972,991
Int. Cl.[3] A63F *1/00*
U.S. Cl. 273—299 3 Claims



1. For use in a card game: a deck of fifty-two playing cards divided into four suits of thirteen cards each, each suit being representative of two different forms of speech, and the four different suits being representative of eight different forms of speech, each card in each suit bearing designations of the two different forms of speech represented thereby, each card in each suit displaying two different letters of the alphabet, the thirteen cards in each suit displaying all twenty-six letters of the alphabet, corresponding cards in all four suits displaying the same two letter combinations; and means for determining trump, said trump determining means comprising a complication of words, the selection of one of which determines trump according to the form of speech of the selected word.

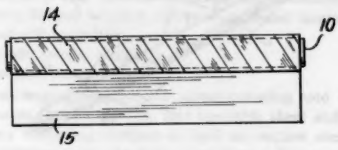
4,234,190

CARBON FIBER-REINFORCED PLASTIC ARROW

Tom P. Airhart, Hurst, Tex., assignor to Skyline Industries, Inc., Fort Worth, Tex.

Filed Feb. 6, 1978, Ser. No. 875,547
Int. Cl.[3] F41B *5/02*
U.S. Cl. 273—420 4 Claims

1. A carbon fiber-reinforced plastic arrow having a tubular shaft with a length of from 25 to 32 inches, a wall thickness of from 0.022 to 0.032 inch and an internal diameter of from 0.19 to 0.26 inch, the larger internal diameters and greater wall thicknesses being used with the longer arrow lengths to provide a stiffness measured by center deflection under a two pound center load while simply supported at both ends of from 0.25 to 0.7 inch, said tubular shaft being constructed of carbon fiber-reinforced plastic to include an interior section in which the carbon fibers run in two directions, each balanced with respect to the other, of at least 30° to the axis of the arrow, and



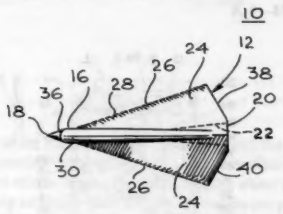
an outer section in which substantially all of the fibers are parallel to the axis of the arrow, said arrow including a head at the forward end of the shaft, said head having a weight of from 45% to 60% of the weight of the shaft, said interior section of said tubular shaft is constituted by two layers of parallel carbon fiber rovings, one layer being wound without overlap at one angle to the axis of the arrow, and the other layer being wound without overlap at the opposite angle to the axis of the arrow.

4,234,191

ARCHERY ARROW HEAD

Roger S. Erlandson, 8600 Rubio Dr., Elk Grove, Calif. 95624

Filed Jan. 31, 1979, Ser. No. 7,904
Int. Cl.[3] F41B *5/02*
U.S. Cl. 273—421 7 Claims



1. An improved plastic archery hunting arrow head, said head being of unitary integral one piece construction, and including:

a. a main plastic body having a longitudinally extending thickened wedge shaped central core, said body being narrow at the front end thereof and wide at the rear end thereof, said front end terminating in a forwardly directed sharp point, and said rear end defining a central forwardly extending opening in said core adapted to receive an arrow shaft;

b. a pair of plastic blades forming the lateral portions of said body and having rearwardly diverging peripherally disposed serrated cutting edges, the serrations of which are forwardly directed; and,

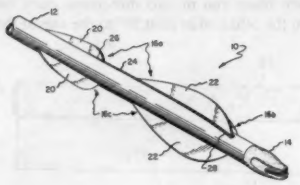
c. a thick central plastic reinforcing and wedging bar extending throughout said body from said point to adjacent said rear end, extending forward of said blades and projecting above and below the main plane of said blades, said bar having a rounded front end of substantial thickness.

4,234,192

BI-DELTA VANE

Joseph L. Salamone, 25 Dempster St., Buffalo, N.Y. 14206

Filed Sep. 19, 1979, Ser. No. 76,865
Int. Cl.[3] F41B *5/02*
U.S. Cl. 273—423 **7 Claims**



4. An arrow having a shaft and a plurality of fletching elements fixed along mounting edges thereof to a rearwardly disposed end portion of said shaft to assume a given angle of helical twist or offset, the improvement comprising in combination:

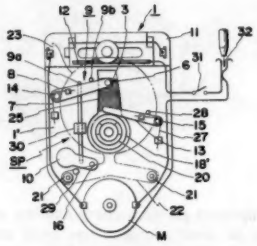
each of said fletching elements includes a leading guide vane and a trailing guide vane, said leading guide vane being relatively smaller than said trailing guide vane and said leading guide vane having its rear edge disposed essentially in an adjacent annular offset relationship relative to the front edge of said trailing guide vane, as viewed from the rear end of said shaft.

4,234,193

SIMPLIFIED PHONOGRAPH CAPABLE OF SELECTING DESIRED GROOVES ON A RECORD DISC

Yutaka Shiseki, Kawasaki, Japan, assignor to Ozen Corporation, Japan

Filed May 29, 1979, Ser. No. 43,319
Claims priority, application Japan, Feb. 27, 1979, 54-22339
Int. Cl.[3] G11B *3/08, 17/06*
U.S. Cl. 274—1 A **7 Claims**



1. A simplified phonograph capable of selecting a record groove on a record disc for sound reproduction which comprises:

(a) a housing;

(b) a record disc having a plurality of record grooves, each groove having a starting point and a terminal point for sound reproduction, the starting point of each groove being radially offset from every other groove and the terminal point of each groove is radially substantially distinct from any starting point;

(c) a driving source for rotating the disc and disposed on that housing;

(d) a tone arm which includes a pick up, the tone arm being swingably mounted on the housing, the tone arm traveling along one of the grooves from the starting point to the terminal point;

(e) means for normally biasing the tone arm toward a starting point of a groove;

(f) a stopper mounted on the housing, the stopper stopping the pickup against a resilient force imparted by the means for biasing, the stopper being positioned at points corresponding to the starting point of each groove, the stopper being constructed such that the pickup can be positioned at a position corresponding to each starting point of each groove, the stopper comprising a movable stopper member retained in the housing, the stopper member being movable in a direction parallel to a plane in which the record disc extends;

(g) a speaker unit housed within the housing, the speaker unit comprising a speaker and a sound transmitter;

(h) means for urging the sound transmitter toward the record disc;

(i) means for actuating the pickup to return the pickup to a starting point, the means for actuating releasing the pickup from a stylus force normally imparted thereto to enable the return of the pickup;

(j) a weight retained in the housing and associated with the movable stopper member, the weight being movably mounted in the housing and being movable with the movable stopper member in the same direction therewith, the weight moving the movable stopper member against the resilient force of the means for biasing to position the movable stopper member in a first position when the phonograph is in a vertical position and the resilient force of the means for biasing moving the weight and the movable stopper member to a second position when the phonograph is in a horizontal position, and

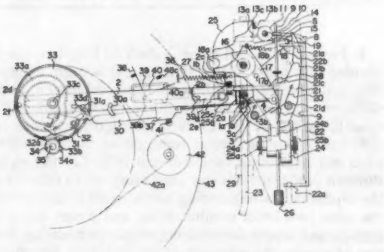
wherein the phonograph selects one record groove to be reproduced when in the horizontal position and a different record groove when in the vertical position.

4,234,194

STYLUS LEAD-IN MECHANISM OF RECORD PLAYER

Hirosi Koyahata, and Nobuo Suzuki, both of 762 Niiharu-cho, Midori-ku, Yokohama-shi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 887,558, Mar. 17, 1978, abandoned. This application Dec. 8, 1978, Ser. No. 967,570
Claims priority, application Japan, Mar. 22, 1977, 52/34652[U]; Oct. 4, 1977, 52/119275; Oct. 17, 1977, 52/138129[U]
Int. Cl.[3] G11B *17/16*
U.S. Cl. 274—10 R **7 Claims**



1. A record player for playing record discs of at least two sizes, comprising in combination:

(a) a turntable **(43)** disposed for rotation in the horizontal plane, a tone arm spindle **(16)** at some distance therefrom;

(b) a tone arm **(23)** with an inner section and also having an outer end, with a record playing stylus at said other end, the inner section of said tone arm being pivotally disposed on said tone arm spindle **(16)** in a manner that said tone arm **(23)** can swing in the horizontal plane so that the stylus can engage the outer playing portion of a record

disc on said turntable (43), said tone arm likewise having at least a limited elevational pivotal movement;

(c) an elongated return lever (2) extending between said turntable (43) and said tone arm spindle (16), said elongated return lever (2) having inner and outer portions;

(d) operating means for operating said tone arm (23) including an operating lever (26) coupled to a two stage cam (24), an elevation means first operating member (3) coupled to said tone arm (23) for elevational movement of said tone arm, said first operating member (3) having a contacting portion in contact with said cam (24), a change-over lever (22) for determining the location of the record playing portion contacted by said stylus, a position restrictive plate (21) with a contact end and having at least first and second defined positions (21*a*, 21*b*) to determine the aforementioned record playing stylus locations, said position restrictive plate (21) having said contact end in contact with said cam (24) and an operation plate (17) attached to said tone arm spincle (16) disposed for reciprocating horizontal motion and having sensing means (18, 19) in contact with said position restrictive plate (21);

(e) an elongated slide lever (30) with inner and outer ends, adjacent said return lever (2) longitudinally moveable along said return lever, the inner end of which is coupled to said operation plate (17);

(e) switch operating means including a switch contact piece (37), intermediate said inner and outer portions of said return lever (2), for longitudinal movement together with the pivotal movement of said tone arm (23), including an operating pin (2*b*) on said return lever (2), a start switch (40) pivotally supported so as to be swingable between moving positions of said switch contact piece (37) and said operating pin (2*b*), a stopper (41) at one side of said switch contact piece (37) so disposed that said start switch (40) can be turned OFF only when said switch contact piece (37), said operating pin (2*b*) and said start switch (40), all occupy a predetermined position;

(f) a turntable shaft (47), a drive pinion (45) mounted on said turntable shaft, a large gear (33) having a cam groove (33*a*) and a notch portion (33*b*) and link claw means (31, 32) which can be caused to engage with said drive pinion (34) by the movement of said slide lever (30), the return lever (2) outer portion extending into engagement with said cam groove (33*a*); and,

(g) tone arm elevating means including a bent portion (2*a*) at the inner portion of said elongated return lever (2); an elevation rod (1) in contact with said bent portion (2*a*), and, an operation plate (17), contacted by said elevation rod (1) said operation plate (17) being pushed by said elevation rod (1) to enable said tone arm (23) to return from a position where said stylus is engaged with a record to an original position before such engagement.

4,234,195

APPARATUSES FOR REPRODUCING SIGNALS FROM ROTARY RECORDING MEDIUMS

Norio Shibata, Sagamihara, Japan, assignor to Victor Company of Japan Ltd., Yokohama, Japan

Filed Feb. 21, 1979, Ser. No. 22,515

Claims priority, application Japan, Mar. 24, 1978, 53/32931; Mar. 24, 1978, 53/32933

Int. Cl.[3] **G11B** *3/60*

U.S. Cl. 274—39 R **7 Claims**

1. An apparatus for reproducing a signal from a rotary recording medium comprising:

a turntable driven to rotate by a rotation driving source;

a turntable sheet carried on said turntable and for carrying and supporting the rotary recording medium thereon thereby to rotate therewith, said turntable sheet comprising an upper base surface, a continuous projection disposed along the outer periphery of said rotary structure and for carrying thereon the peripheral edge of said rotary recording medium, a plurality of projections dispersed inward of said peripheral continuous projection and for carrying thereon said rotary recording medium, holes formed to extend in the direction of the thickness of said turntable sheet and open at said upper base surface and grooves formed in the lower surface of said turntable sheet communicatively connected with said holes and extending up to near the center of said turntable, first enclosed spaces being formed between a rotary recording medium carried on said projections and the upper base surface of said turntable sheet and second enclosed spaces being formed between said grooves in said turntable sheet and said turntable;

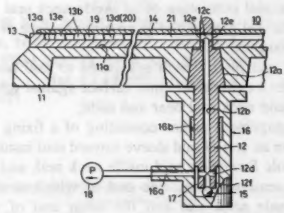
a spindle for the turntable;

air suction means; and

a communication structure communicating said enclosed spaces formed between said turntable sheet and said rotary recording medium to said air suction means, said communication structure comprising a first communication passage formed in said spindle to provide communication to said second enclosed spaces, and a second communication passage for communicatively connecting said first communication passage to said air suction means.

7. An apparatus for reproducing a signal from a rotary recording medium comprising:

a turntable driven to rotate by a rotation driving source;



a turntable sheet carried on said turntable and for carrying and supporting the rotary recording medium thereon thereby to rotate therewith, said turntable sheet integrally comprising an upper base surface, a continuous projection disposed along the outer periphery of said rotary structure and for carrying thereon the peripheral edge of said rotary recording medium, and a plurality of projections dispersed inward of said peripheral continuous projection and for carrying thereon said rotary recording medium, enclosed spaces being formed between the rotary recording medium carried on said projections and the upper base surface of said turntable sheet;

a spindle for the turntable;

air suction means; and

a communication structure communicating said enclosed spaces formed between said turntable sheet and said rotary recording medium to said air suction means,

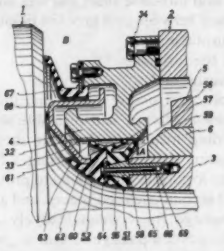
said communication structure comprising an opening formed in said spindle and opening at a position higher than the upper base surface of said rotary structure and communicating to said spaces, a first communication passage communicating to said opening and extending through the spindle, and a second communication passage for communicatively connecting said first communication passage to said air suction means.

4,234,196

ROLL NECK SEALING DEVICE

Yoshimi Iida, Kawasaki, Japan, assignor to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1979, Ser. No. 59,161
Claims priority, application Japan, Feb. 21, 1979, 54-21275[U]
Int. Cl.³ F16J 15/32, 15/38
U.S. Cl. 277—12 3 Claims



1. A roll neck sealing device comprising:
a sleeve mounted on an outer surface of a roll at one end;
a bushing mounted on said sleeve for relative rotation with respect to said sleeve;
a housing secured to an outer surface of said bushing for supporting said roll;
a neck seal consisting of an inside neck seal and an outside neck seal, both fitted to an outer surface of a neck portion of said roll;
a seal end plate which is secured to said housing and provides a cylindrical inner surface against which sealing lips of said neck seal bear and slide;
an engagement means consisting of a fixing pin projecting from an end of said sleeve toward said inside neck seal and a hole formed in said inside neck seal; and
a preventive means, one end of which is secured to said outside neck seal and the other end of which extends through said hole into a core hole formed in said fixing pin which is received in said sleeve, said preventive means being adapted for preventing relative rotation between said neck seal and said sleeve;
whereby an axial length over which said preventive means is inserted into said fixing pin is set at a distance greater than the maximum allowable axial play between said sleeve and said bushing that is caused when the sealing member is being replaced.

4,234,197

CONDUIT SEALING SYSTEM

Amareswar Amancharla, League City, Roger A. Weinberg, Houston, both of Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jan. 19, 1979, Ser. No. 4,786
Int. Cl.³ F16J 15/18; F21B 23/00
U.S. Cl. 277—124 9 Claims

1. In a seal system carriable by a first conduit and sealingly engageable with a second conduit within a well bore for isolating an annular section between said conduits, the improvement comprising: a plurality of longitudinally extending, selectively spaced annular seal assemblies, each of said assemblies being separated one from another by a rigid spacing member, each of said assemblies comprising a plurality of annular seal members wherein each of the outermost seal members adjacent to the spacing member have a coefficient of expansion greater than that of the rigid spacing member and said second conduit and wherein each of the outermost seal members is not extrudable

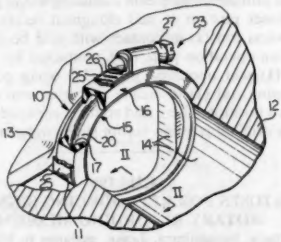
over said rigid spacing member during sealing engagement between the conduits.

4,234,198

WATER SEAL ASSEMBLY FOR ENGINES

Gary G. Martin, Morton, and James C. Smith, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 12, 1976, Ser. No. 731,605
Int. Cl.³ F16J 15/10
U.S. Cl. 277—145 6 Claims



1. A seal assembly comprising
a circumferentially uninterrupted annular ferrule formed as a rigid, one-piece construction, including a generally V-shaped camming portion and a pair of flanges each connected to an end of said camming portion,
a circumferentially uninterrupted annular elastomeric seal circumferentially surrounding said ferrule and having a generally V-shaped groove formed circumferentially thereabout and between sidewalls thereof, the camming portion of said ferrule at least partially disposed in sliding relationship in said groove, and
clamping means circumferentially surrounding said seal for applying a clamping force thereon to expand the sidewalls thereof outwardly away from each other and against the rigid backing of said ferrule.

4,234,199

SEALING ARRANGEMENTS

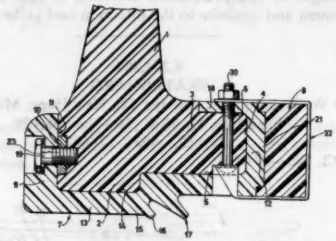
Michael B. Moncaster, Cumbria, and James D. Rummer, Barrow-in-Furness, both of England, assignors to Vickers Limited, London, England

Filed Feb. 6, 1978, Ser. No. 873,894

Claims priority, application United Kingdom, Feb. 4, 1977, 4769/77

Int. Cl.³ F16S *13/00, 15/10*

U.S. Cl. 277—237 R **1 Claim**



1. In combination,

(A) a open ended member having

(i) a rim at its open end,

(ii) an internal face adjacent the rim, and

(iii) an outwardly extending radial flange adjacent the rim, and

(B) a sealing arrangement for providing a fluid tight seal between the rim of the open ended member and a second member, said sealing arrangement comprising,

(i) a resilient first ring comprising (a) an inner cylindrical portion in contact with the internal face of the open ended member, (b) an outer cylindrical portion including an inwardly directed annular channel fitted over the radial flange of the rim, and (c) an annular portion linking the cylindrical portions, said annular portion having a face in contact with the rim and an opposite annular face for sealing engagement with the second member and having at least one sealing lip protruding therefrom, and

(ii) a resilient second ring concentrically mounted on the first ring and resiliently secured to the open ended member that the second ring is radially displaceable so as to accommodate changes in the dimension of the first ring when the first ring is deformed as a result of the first and second members being urged together under pressure.

4,234,200

DYNAMIC IMBALANCE DETERMINING SYSTEM

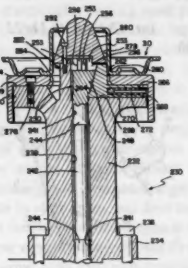
Donald E. Orem, Indianapolis; Vernon P. Holmes, Danville, both of Ind., and Thomas J. Bacsanyi, Novi, Mich., assignors to Ransburg Corporation, Indianapolis, Ind.

Division of Ser. No. 927,760, Jul. 25, 1978, Pat. No. 4,191,055. This application Sep. 7, 1979, Ser. No. 73,212

Int. Cl.³ B23B *31/16, 31/30*

U.S. Cl. 279—2 A **8 Claims**

1. A chuck for holding a rotary element having a center hole, the chuck comprising a chuck body including an upwardly facing surface and a central hub portion, means defining a plurality of first slideways in the upwardly facing surface, means defining a plurality of cooperating second slideways in the central hub portion, the first and second slideways being arranged to radiate from a central axis of the hub, the first slideways being disposed radially outwardly from associated second slideways, a plurality of chuck jaws, each chuck jaw including means engageable in a respective first slideway to mount the jaws for movement radially of the hub, means engageable in a respective second slideway to provide a tongue for controlling the position of the jaw radially of the hub and means defining a surface for engagement in the center hole to capture the rotary element on the chuck, and a control member movably disposed in the hub and providing a plurality of control surfaces engageable in the second slideways to move into interfering relationship with the tongues, and means for moving the control member upwardly to permit the tongues



and jaws, and thereby the engaging surfaces, to be moved radially inwardly to release a rotary element center hole, the control member being normally urged downwardly to force the tongues and jaws, and thereby the engaging surfaces, radially outwardly to engage a rotary element center hole and capture the rotary element on the chuck.

4,234,201

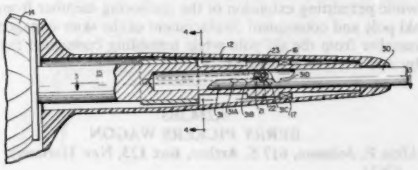
CHUCK FOR MINIATURE ROTARY TOOL

Irvin Sorensen, 1015 Manchester St., Arlington, Va. 22205

Filed Jan. 29, 1979, Ser. No. 7,198

Int. Cl.³ B23B *31/08*

U.S. Cl. 279—77 **5 Claims**



1. A motor driven rotary tool comprising;

a rotatable drive shaft having a longitudinal axis;

a chuck assembly rotatable with said drive shaft and having a longitudinal bore therein extending along the same direction as the longitudinal axis of said drive shaft, said longitudinal bore having diametrically opposed sidewall portions;

a tool bit having a shank portion with a semi-circular cross-section transversely of the longitudinal axis thereof in the provision of a flat surface on said shank portion; and

a U-shaped wire spring having a pair of legs and a central portion, said legs being secured to the external surface of said drive shaft and extending therealong, parallel to said longitudinal axis, said central portion passing transversely through said longitudinal bore and being normally centered in said bore, the cumulative cross-sectional dimension of said shank portion and said central portion of said wire spring being less than the diameter of said longitudinal bore when said flat surface is substantially parallel to said central portion, said cumulative cross-sectional dimension equalling and teding to exceed said diameter of said bore when said flat surface is disposed at a predetermined angle with respect to said central portion;

whereby said tool bit is secured within said bore when said flat surface is twisted to said predetermined angle with respect to said central portion.

4,234,202

SKI POLE

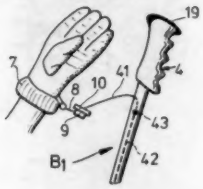
Eberhard Loffelholz, Thurgauerstrasse 13a, Singen, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,454

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2707959

Int. Cl.³ A63C *11/22*

U.S. Cl. 280—820 **8 Claims**



1. The combination of a ski pole and attachment means for detachably connecting said ski pole to the skier in the vicinity of the hand of the skier, said ski pole comprising a tube having a lower pointed end and an upper end, a transverse member on said tube adjacent said pointed end, a hand grip on said tube at said upper end, said attachment means comprising a skier-engagement member and anchoring means of limited elasticity coupling said skier-engagement member with said ski pole in the vicinity of said grip, said anchoring means comprising an anchoring member retractable in and extensible from said ski pole, said anchoring member having one end with means for attachment to said skier-engagement member, and resilient means extending axially within said tube operatively engaging the other end of said anchoring member for biassing said anchoring member to retracted position within said ski pole while permitting extension of the anchoring member from the ski pole and consequent displacement of the skier-engagement member from the ski pole while remaining connected thereto by said anchoring member.

4,234,203

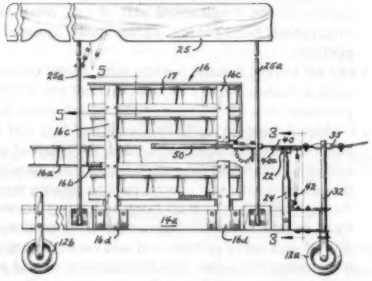
BERRY PICKERS WAGON

Alvin P. Johnson, 617 S. Arthur, Box 123, New Harmony, Ind. 47631

Filed Mar. 26, 1979, Ser. No. 24,165

Int. Cl.³ A01D *67/04*

U.S. Cl. 280—32.5 **5 Claims**



1. A crop pickers wagon which straddles a row of crops comprising front wheels and rear wheels mounting a framework supporting a platform for seating a picker at the rear end thereof and affording unrestricted crop access, a steering arrangement disposed at the opposite end of said platform behind said picker and operable by said picker in a seated position, and means forming part of said steering arrangement selectively guiding movement of the wagon in a preselected direction, said guiding means defined by a framework mounted bar having a plurality of notches therein, a centrally disposed pivotal handle controlling movement of a parallelogram shaped operating framework for said front wheels, the latter simultaneously responding to movement of opposite sides of said operating framework, and resilient means selectively positioning said pivotal handle in one of said notches in said bar and locking the direction of said front wheels and wagon movement, where foot action by the picker with the supporting ground propels the wagon in said preselected direction of said steering arrangement and opposite to the direction said picker faces.

4,234,204

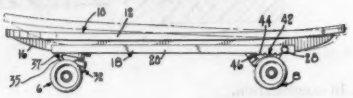
SKATEBOARD

Kerry W. Tibbals, 2720 Rosalyn Ct., New Hope, Minn. 55427

Filed Dec. 11, 1978, Ser. No. 968,129

Int. Cl.³ A63C *17/14*

U.S. Cl. 280—87.04 A **12 Claims**



1. An improved skateboard, which comprises:

(a) a multi-part board unit, which includes:

(i) an elongated board member suited for supporting a rider thereon;

(ii) a frame;

(iii) means for pivotably mounting at least a portion of the board member relative to the frame for rotation about a substantially horizontal pivot axis;

(b) at least one wheel support unit carried adjacent and attached to each end of the board unit for rollably supporting the board unit on a ground surface, wherein each wheel support unit has one or more ground engaging wheels; and

(c) wherein one wheel support unit is carried on the pivotal portion of the board member with the wheel or wheels thereof being spaced from the frame when the pivotal portion is in a first position, whereby rotation by the rider of the pivotal portion to a second position causes the wheel or wheels of the one wheel support unit to engage the frame to effect a braking action thereon.

4,234,205

SUSPENSION FOR INDEPENDENT VEHICLE WHEELS

Pierre Thiesce, Velizy, France, assignor to Societe Anonyme Automobiles Citroen and Automobiles Peugeot, both of, France

Filed Jun. 2, 1978, Ser. No. 912,055

Claims priority, application France, Jun. 10, 1977, 77 17917

Int. Cl.³ B60G *11/20*

U.S. Cl. 280—723 **8 Claims**

1. In a suspension for a set of independent wheels of a vehicle,

a cross member fixed to the structure of the vehicle,

transverse hub means,

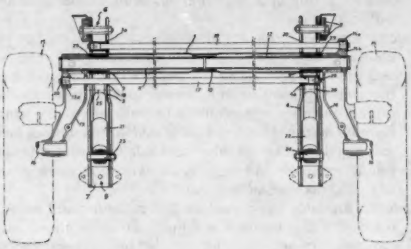
means supporting said hub means on said cross member for rotational and axial translational movement,

an axle arm on each side of the vehicle and each having a first end connected to said hub means wherein said axle arms are axially movable to relative to said cross member,

a pair of wheels, each rotatably supported adjacent a second end of a said axle arm,

a pair of torsion bars spaced from the axis of said hub means and extending transversely of the vehicle, each having one end directly connected to a said axle arm and the other end connected to an element fixed to said structure,

means connecting said torsion bar ends to said axle arms and said elements without rotation and without translation,

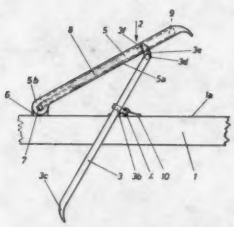


whereby upon movement of a said axle arm about the axis of its hub means, said torsion bars will be subjected to torsion and flexion.

4,234,206
SKI BRAKE

Rupert Hofbauer, Schwechat; Friedrich Leichtfried, Traiskirchen, and Josef Svoboda, Schwechat, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Aug. 11, 1978, Ser. No. 932,789
Claims priority, application Austria, Aug. 18, 1977, 5956/77; Nov. 3, 1977, 7829/77
Int. Cl.³ A63C 7/10
U.S. Cl. 280—605 **17 Claims**

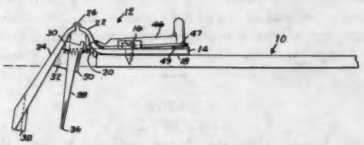


1. A ski brake for use on a ski, comprising:
mounting means adapted to be mounted to said ski;
pedal means and first pivot support means for pivotally securing said pedal means to said mounting means for movement about a first axis perpendicular to the longitudinal axis of said ski between an upright first position and a second position generally parallel to the under surface of said ski, said pedal means at an end thereof remote from said first pivot support means having a pair of laterally spaced guideways opening outwardly in a bottom surface thereof opposing the upper surface of said ski, said guideways each having at least a pair of angled segments, a first segment of said pair of segments extending in a plane parallel to the longitudinal axis of said ski and a second segment of said pair of segments extending transversely to said longitudinal axis of said ski;
a pair of ski brake arms and second pivot support means for pivotally securing said pair of ski brake arms to said mounting means for movement about a second axis extending parallel to said first axis between a braking position and a retracted position and a third axis orthogonally related to said second axis, each of said ski brake arms having at a first end thereof means adapted to engage the snow and at a second end thereof guide means received in a respective one of said pair of guideways, said second pivot support means being located intermediate said first and second ends, each of said guide means comprising at least one elongated segment extending transversely of the longitudinal extent of said ski brake arm and being slidingly disposed in said first and second segments of said guideway;
means for preventing a separation, during use, of each of said ski brake arms from said guideways in said pedal means; and
resilient means for continually urging said pedal means to said upright first position, the fixed spacing between said first and second pivot support means causing, when said pedal means is in said upright position, said elongated segment on each of said ski brake arms to be located in said first segment of each of said guideways and said first ends of each of said ski brake arms to project below the bottom surface of said ski, a movement of said pedal means against the urging of said resilient means to said second position causing said elongated segment on each of said ski brake arms to slide from said first segment of each of said guideways into said second segment of each of said guideways to cause a positioning of said first ends of each of said ski brake arms over said upper surface of said ski.

4,234,207
SKI BRAKING DEVICE

Walter J. De Vigili, Roseville, Mich., assignor to Louis E. Hough, Roseville, Mich.

Filed Nov. 24, 1978, Ser. No. 963,421
Int. Cl.³ A63C 9/10
U.S. Cl. 280—605 **6 Claims**



1. A braking device for preventing rearward movement of a ski, such as when climbing a hill, comprising, a plate member having a generally flat bottom face adapted to be fixedly mounted on the upper face of a ski at the rear end thereof, a brake member resiliently hinged to the rear end of said plate member, said brake member comprising a pair of downwardly projecting blades integrally connected together adjacent their upper ends in fixed relation adjacent the hinge, said blades having their free ends normally projecting downwardly and rearwardly from the rear end of said plate member and being spaced apart in a direction lengthwise of the plate member, the blade closest the rear end of the plate member being substantially narrower and normally inclined downwardly at a greater angle to the plane of the ski than the blade more remote from the rear end of the ski, said narrower blade being adapted to engage the snow surface over which the ski is travelling, whereby, when the ski tends to move rearwardly on a snow-covered surface, the narrower blade promptly digs into the underlying snow and thereby causes the brake member as a whole to pivot downwardly and forwardly about said hinge so that the wider blade digs progressively deeper into the snow and thereby produces a substantial braking action against rearward movement of the ski, said plate member and said brake member comprising an integral one-piece plastic molding and said hinge comprising a thinned section between the plate member and the brake member.

4,234,208

BINDING FOR SECURING A BOOT OR SHOE ON A TOURING OR CROSS-COUNTRY SKI

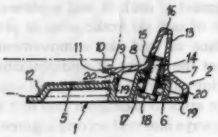
Wolf Anderié, Strasbourg, France, assignor to Adidas Fabrique de Chaussures de Sport, Strasbourg, France

Filed Feb. 5, 1979, Ser. No. 9,151

Claims priority, application France, Feb. 9, 1978, 78 03709

Int. Cl.³ A63C 9/08

U.S. Cl. 280—614 **4 Claims**



1. A device for fastening a boot on a touring or cross country ski comprising an articulated means for fixing the front of the boot on the ski and a rib disposed along the axis of the ski to engage a longitudinal groove in the bottom of the heel of the boot when the skier rests his heel on the ski, said fastening device including a stationary lower portion fixed to the ski and presenting said rib, and an upper portion comprising, an integral projecting curved flange, inclined at an angle with respect to the horizontal, means connecting the upper portion to the lower portion for rotation with respect to the lower portion between a first position in which said projecting flange engages a transverse groove in the rear face of the heel of the boot above its longitudinal groove, when the rib on the lower portion of the fastening device is engaged in said longitudinal groove of the boot, and at least one second position in which said projecting flange is disengaged from said transverse groove, and return means for pulling said upper portion of the fastening device against its lower portion in each of the said positions, and grippable means on said upper portion for rotating said upper portion to said first and second positions.

4,234,209

SEAT BELT

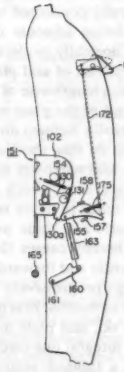
Haruyuki Ikesue, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Nov. 13, 1978, Ser. No. 959,841

Claims priority, application Japan, Nov. 14, 1977, 52-151564[U]; Jul. 4, 1978, 53-80499

Int. Cl.³ A62B 35/02; B65H 75/48

U.S. Cl. 280—803 **14 Claims**



1. A system for making inoperative the emergency locking mechanism of an emergency lock type of retractor when there is no need for emergency locking comprising:

means for taking up a webbing, including a main gear and a subsidiary gear;

inertia sensitive means for directly sensing a change of vehicle speed beyond a predetermined level;

means for locking the take-up means to prevent pull-out of the webbing, said locking means including a subsidiary ratchet member engageable with said subsidiary gear in response to the sensing action of said inertia sensing means and a main ratchet member movable with said subsidiary ratchet member and engageable with said main gear to lock said take-up means; and

a lever rotatably supported on the retractor and movable between a first position in which said lever allows a free movement of said subsidiary ratchet member and a second position in which said lever restrains the movement of said subsidiary ratchet member, said lever having a recess which engages a projection on the subsidiary ratchet member when the lever is in the second position, and said lever being moved to said second position when there is no need for emergency locking.

4,234,210

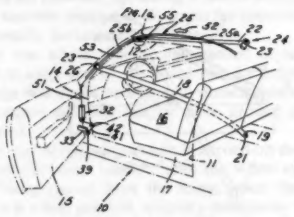
PASSIVE RESTRAINT ACTUATOR MECHANISM SYSTEM

Thomas E. McNally, Mt. Clemens; Thomas C. Holka, Farmington Hills, and Harold T. Moreau, Canton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 22, 1979, Ser. No. 68,842

Int. Cl.³ B61R 21/10

U.S. Cl. 280—804 **9 Claims**



1. In combination with a vehicle body having a door opening for ingress/egress to a passenger compartment, the door opening being framed at its upper edge by a roof rail extending longitudinally of the compartment and at its forward edge by a windshield side pillar extending downwardly from the forward end of the roof rail to a vertical hinge pillar to which the door is hinged for swinging movement between opened and closed positions and a floor mounted passenger seat adjacent the door opening,

a passive belt system for restraining a seat occupant within the seat, comprising:

a two-point belt anchored at one end to a vehicle floor fixed attachment means at the inboard side of the seat and at its other end to a retractor mechanism anchored in the vehicle roof rearwardly and outwardly of the seat,

the belt in passenger restraining position extending diagonally over the upper torso of a seat occupant from the floor attachment to the retractor mechanism,

track means paralleling the roof rail and extending from the forward end of the latter downwardly along the windshield pillar,

carriage means movable along the track means having belt engageable means engageable with the belt intermediate the anchored ends of the latter,

and nonelectrical energizing means responsive to the motion of the door when moved to door opening position to energize the belt system,

the energizing means including a lever means swingable in the door opening about a door hinge pivot,

a compressed fluid linear actuator mounted on the vehicle body forwardly of the hinge pillar and coupled to the lever means to swing the same outwardly of the door opening,

and a displacement multiplying multiple-sheave block mounted on the vehicle body forwardly of the hinge pillar operatively interposed between the lever means and the carriage means whereby short linear movement of the piston rod of the actuator swinging the lever means provides multiplied linear movement of the carriage means along the track means,

the carriage means being movable by the energizing means along the track means from the retractor end of the latter to the point at which the track means swings downwardly along the windshield pillar, the carriage means movement terminating at a terminal position near the hinge pillar end of the track means,

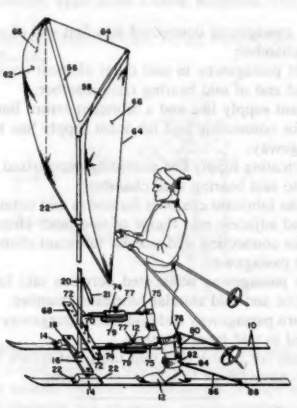
the carriage means during such movement automatically withdrawing the belt forwardly from its passenger restraining position toward the forward end of the compartment to provide unobstructed ingress or egress to the compartment through the door opening.

4,234,211

SKI SAIL APPARATUS

Gregory Lux, 218 School St., Woburn, Mass. 01801

Filed Apr. 27, 1979, Ser. No. 33,553
Int. Cl.[3] A63C *11/00*
U.S. Cl. 280—810 **2 Claims**



1. A sail apparatus to be utilized with snow skis comprising:
sail means;
means for affixing said sail means to said skis;
control means for the control of said sail means;
wherein said sail means include:
a sail member;
a mast member upon which said sail member is mounted;
pivot means for affixing said sail means to said skis, said pivot means affixed to each of said skis;
a cross member attached to said pivot means;
a mast receipt member affixed to said cross member;
wherein said control means include:
a torsion bar affixed to said mast;
attachment means to interconnect the skier to said torsion bar; and
wherein said attachment means include a rod member adapted to be interconnected to said torsion bar;
leg members adapted to be affixed to the skier's calves; and
shock absorbing means interposed between and interconnected with said rod member and said leg members.

4,234,212

RECORDING SHEET

Hajime Kato, and Yasuhiro Ogata, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 6, 1978, Ser. No. 939,934
Claims priority, application Japan, Sep. 6, 1977, 52-106881
Int. Cl.[2] B41M *5/16, 5/18, 5/22*
U.S. Cl. 282—27.5 **11 Claims**

1. A recording sheet capable of development of color on contact with a substantially colorless electron donating organic compound comprising a support having thereon a coated layer of a dispersion of (1) at least one salt of a polyvalent metal and an aromatic carboxylic acid, (2) at least one water-soluble polymer containing hydroxy groups and (3) a methylated methylalmelamine resin.

4,234,213

CARBONLESS RECORD SYSTEM

Hugh B. Skees, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Filed Oct. 12, 1978, Ser. No. 950,693
Int. Cl.[3] B41M *5/22*
U.S. Cl. 282—27.5 **10 Claims**

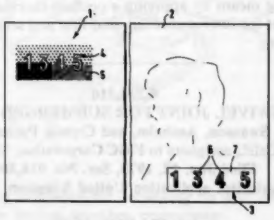
1. A pressure-responsive record transfer sheet comprising:
a substrate sheet and a coating on at least one surface of the substrate sheet, wherein the coating is an acidic reactant transfer coating capable of producing useful color when and where brought into intimate reactive contact with an organic, relatively colorless, chromogenic, dye-precursor, and wherein the coating comprises a solid, frangible resin, an organic liquid dye-precursor solvent of low volatility having a boiling point above about 150 degrees centigrade at 10 millimeters of mercury and a vapor pressure below 20 millimeters of mercury at 100 degrees centigrade, and a solid particulate inorganic acidic reactant, wherein the solid acidic reactant is dispersed in a heated mixture of resin and liquid solvent, and wherein the solid acidic reactant is insoluble in the liquid solvent.

4,234,214

DOCUMENT CARRYING A LEGIBLE CODE, AND METHOD AND APPARATUS FOR PRODUCING SAME

Peter D. Lee, Hertford, England, assignor to Governor & Company of the Bank of England, London, England

Filed Aug. 16, 1978, Ser. No. 934,061
Int. Cl.[3] B42D *15/00*; B41L *27/30*
U.S. Cl. 283—57 **11 Claims**



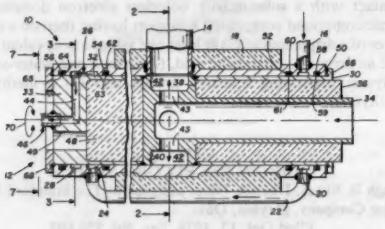
1. A set of banknotes, wherein each banknote carries at a first position a legible code, unique to that banknote, consisting of an arrangement of alphanumeric characters in a negative reverse form within a multi-color background which immediately surrounds said characters and which is printed upon the banknote using printing media of a plurality of different colors,

and also carries at a second position a further legible code consisting of said named arrangement of alphanumeric characters in a positive form, and wherein said codes comprise serial numbers by which the banknotes are sequentially numbered.

4,234,215
ROTARY PIPE JOINT

Lee E. Wilson, Dallas, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Jun. 5, 1978, Ser. No. 912,489
Int. Cl.³ F16L *53/00*
U.S. Cl. 285—41 **21 Claims**



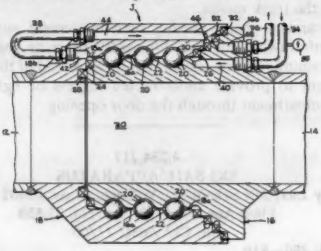
1. A rotary pipe joint comprising:
(a) a first tubular member having a transversely disposed fluid transmission port,
(b) a second tubular member disposed within said first tubular member and coaxially rotatable relative to said first tubular member,
(c) fluid transmission means having an axis coplanar with the axis of said fluid transmission port and connecting the interior of said second tubular member to said fluid transmission port,
(d) first pressure sealing means disposed between said first tubular member and said second tubular member to one side of the fluid transmission port,
(e) second pressure sealing means disposed between said first tubular member and said second tubular member to the same side of the fluid pressure port as said first pressure sealing means and displaced therefrom,
(f) third pressure sealing means disposed between said first tubular member and said second tubular member to the opposite side of the fluid transmission port as said first and second pressure sealing means,
(g) fourth pressure sealing means disposed between said first tubular member and said second tubular member to the same side of the fluid transmission port as said third pressure sealing means and displaced therefrom,
(h) means for cooling said first and second pressure sealing means by applying a coolant therebetween,
(i) second means for cooling said third and fourth pressure sealing means by applying a coolant therebetween, and
(j) means for interconnecting said first and second means for cooling.

4,234,216
PIPE SWIVEL JOINT FOR SUBMERGED SERVICE

Harold N. Swanson, Anaheim, and Cryssis Pashalis, Fullerton, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Jun. 12, 1978, Ser. No. 914,304
Claims priority, application United Kingdom, Jan. 7, 1978, 606/78
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—93 **5 Claims**

1. A pipe swivel joint for connecting together a pair of pipes useful for submerged service, said joint comprising:
an annular inner element having an annular groove in the outer surface thereof, said inner element having a radially outward extending flange at one end thereof;
an annular outer element having an annular groove in the inner surface thereof, said outer element having a radially inward extending flange at one end thereof, said outer element surrounding said inner element;
bearing means mounted between said outer element and said inner element, said bearing means comprising a plurality of rollable elements residing in a bearing race chamber that is defined by said grooves in the outer surface of said inner element and in the inner surface of said outer element, said bearing means interacting with said annular grooves to hold said joint together;
a first annular seal mounted between the flange on said outer element and the end of said inner element to provide a fluid-tight seal between said bearing race chamber and an inside of said swivel joint;
a second annular seal mounted between the flange on said inner element and the end of said outer element to provide a fluid-tight seal between said bearing race chamber and an outside of said swivel joint;



an inlet passageway connected to a first end of said bearing race chamber;
an outlet passageway in said outer element connected to a second end of said bearing race chamber;
a lubricant supply line and a lubricant return line;
means for connecting said lubricant supply line to said inlet passageway;
said lubricating supply line providing pressurized lubricating fluid to said bearing race chamber;
an annular lubricant chamber formed in said outer element in the end adjacent said flange of said inner element;
means for connecting said annular lubricant chamber to said outlet passageway;
a return passageway connected between said lubricant return line and said annular lubricant chamber,
said return passageway and said inlet passageway each being formed in said inner element;
and means for connecting said lubricant return line to said return passageway in said inner element.

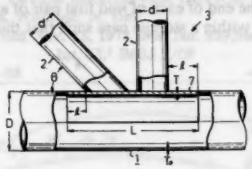
4,234,217
PIPE JOINT CONSTRUCTION

Suguru Sakamoto; Takuzo Nakazato; Tsugio Minoshima, all of Amagasaki, and Tohachiro Tanaka, Tokyo, all of Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 20, 1978, Ser. No. 888,275
Claims priority, application Japan, Mar. 22, 1977, 52-31947
Int. Cl.² F16L *13/02*
U.S. Cl. 285—150 **5 Claims**

1. A pipe joint construction comprising:
a main pipe of circular external cross section and having a wall with outer diameter D, a major part of the wall being of thickness To and a portion of the wall of said main pipe integral with said major part having a wall thickness T greater than To; and
at least one branch pipe having a circular cross section and an outer diameter d, the end of said branch pipe being welded to said portion of the wall of said main pipe, said

portion of the wall of said main pipe subtending an angle ϕ at the center of said main pipe and said central angle being determined by the following relationship:



$$1 > \phi/2\pi \geq (\alpha^3/k)(d/D)^{1/4}(D/T)^{1/4}(T/To)$$

where α represents a rigidity ratio, and k represents a constant depending on the type of joint.

4,234,218

FEEDTHROUGH DEVICE

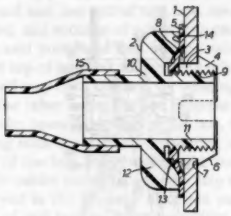
Albert G. Rogers, Cricklade, England, assignor to Raychem Limited, London, England

Filed Sep. 26, 1977, Ser. No. 836,770

Claims priority, application United Kingdom, Oct. 1, 1976, 40792/76

Int. Cl.[2] **H01B** *17/26, 17/30;* **F16L** *5/00*

U.S. Cl. 285—162 **20 Claims**



1. A feedthrough device for sealing a supply line within an aperture in a wall member, which comprises

(a) a first tubular member comprising a portion adapted to extend through the aperture, which portion is radially deformable to allow insertion of said portion through the aperture and is provided with a laterally extending shoulder surface adapted to abut one side of the wall to prevent withdrawal of said portion through the aperture, the first tubular member abutting only said one side of the wall;

(b) a second tubular member having a relatively non-deformable portion adapted to engage with the first tubular member to restrain the laterally extending shoulder surface of the deformable portion against radially inward deformation;

(c) an outwardly projecting flange member coaxially disposed in relation to the first tubular member and axially movable with respect thereto to co-operate with the laterally extending shoulder surface to exert an axial clamping action therebetween thereby effecting a seal at the wall member adjacent said flange member, and

(d) a recoverable sleeve adapted, on recovery, to effect a seal between the device and the supply line.

4,234,219

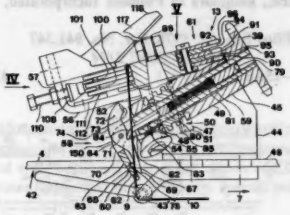
KNOTTER WITH IMPROVED BILLHOOK AND ACTUATION MECHANISM

Marc G. Vansteelant, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Division of Ser. No. 916,371, Jun. 16, 1978, Pat. No. 4,161,097. This application Apr. 23, 1979, Ser. No. 32,204

Int. Cl.[3] **A01D** *59/04*

U.S. Cl. 289—2 **9 Claims**



1. In a crop baling machine having an apparatus for tying a knot in primary and secondary portions of twine, said apparatus including a support frame, a twine holding mechanism mounted on said frame, a billhook rotatably mounted on said frame adjacent said twine holding mechanism and an actuation means also mounted on said frame adjacent said billhook to open and close same at selected locations along its rotary path, the improvement wherein:

said actuation means comprises a rotatable cam mounted on a fixed spindle, said spindle being fixed relative to the rotation of said billhook; and

said billhook includes a fixed jaw and movable jaw pivotably mounted on said fixed jaw, said movable jaw further including a cam follower for contacting said rotatable cam and opening and closing said billhook in response to the surface variations of said cam.

4,234,220

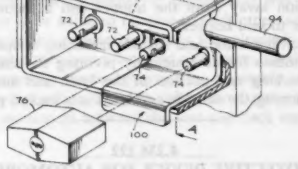
EXTERIOR SAFETY LOCK APPARATUS

Harry E. Finch, 5273 Vista del Sol, and Geza J. Szayer, 5335 Canterbury St., both of Cypress, Calif. 90630

Filed Jun. 19, 1978, Ser. No. 916,553

Int. Cl.[3] **E05C** *1/04, 13/02;* **E05B** *65/06*

U.S. Cl. 292—148 **25 Claims**



1. A locking assembly for mounting on one of a pair of members to be latched together, comprising:

a housing;

a slidable latch supported by and movable relative to the housing between latched and unlatched positions;

a first pair of shackle pins;

means for mounting said first pair of shackle pins within said housing for engaging a removable padlock body when positioned thereon; and

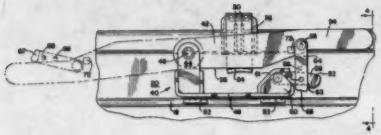
a lockout tab affixed to the slidable latch for movement therewith, said lockout tab serving to block movement of the latch in either direction between said latched and unlatched positions when a padlock body is in position to engage the shackle pins.

4,234,221

TROUGH HATCH LOCKING DEVICE

Thomas L. Przybylinski, and Eugene R. Tylisz, both of Michigan City, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Sep. 11, 1978, Ser. No. 941,347
Int. Cl.³ E05C *3/14*
U.S. Cl. 292—256.5 **13 Claims**



1. A locking device for a hopper having a roof provided with a hatch opening surrounded by upstanding coaming, and pivoted hatch cover means rotatable to engage said coaming to close the hatch opening, the improvement comprising;

a pivoted hinge strap with means adjacent said hatch opening for supporting the hinge strap;

said hinge strap including means rotatable in a first plane between a hatch open position away from said hatch cover and a hatch closed position adjacent said hatch cover;

said hinge strap having a locking extension protruding outwardly of said coaming when the hinge is in the hatch closed position;

a locking bar having bracket means mounted on the roof for rotational movement of the bar in a second plane transverse to said first plane, and said locking bar being movable between a locked and unlocked position;

means on the locking bar engaging the hinge strap extension when the locking bar is in said locked position and the hinge strap is in the hatch closed position;

means for securely interconnecting the hinge strap and locking bar;

said means for interconnecting comprising a shackle and a latch hook;

shackle pivot means mounting said shackle intermediate the ends of the locking bar for pivotal movement;

latch pivot means on said bracket means pivotally mounting said latch hook for limited, rotational movement;

stop means with means associated with said latch hook for limiting the rotation of said latch hook between a first position away from the hopper and a second position closer to said hopper;

said latch hook and said shackle including cooperating surface means for automatically pivoting the shackle about the locking end portion of the latch and automatically positioning the shackle and latch in a locked position.

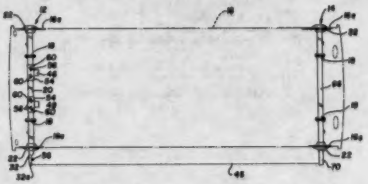
4,234,222

PROTECTIVE DEVICE FOR AUTOMOBILES

Marvin J. Bays, Rte. 1, Box 41AA, Stillwater, Okla. 74047

Continuation-in-part of Ser. No. 901,529, May 1, 1978, abandoned. This application May 29, 1979, Ser. No. 43,367
Int. Cl.³ B60R *19/00*
U.S. Cl. 293—124 **5 Claims**

1. A vehicle body protection device comprising: a first pair of arms extending outwardly from the rear side portions of the vehicle and slideably disposed through the side of the body of the vehicle such that the arms are moveable from a first position extended from the side of said vehicle to a position retracted within said vehicle; a second pair of arms extending outwardly from the forward portion of the vehicle, said arms slideably disposed within the side of the vehicle such that the second pair of arms are moveable from a first position extended outwardly from the side of said vehicle to a position wherein they are retracted within the wall of said vehicle; a roller disposed on the end of each of said first pair of arms; a flexible band secured within a storage case such that the band may be



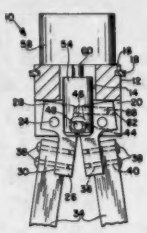
retracted and stored within said case, said band being positioned over said rollers on said first pair of arms and adapted to be pulled from said first pair of arms to said second pair of arms and secured thereto such that the band extends along the side of the body of the vehicle; and means to prevent said band from becoming slack between said two arms such that an object striking said band is slowed or deflected away from the vehicle body.

4,234,223

DRIVE MECHANISM FOR A PICK-AND-PLACE UNIT

James P. O'Neil, Swansea, Mass., assignor to Automation Designs, Inc., Bristol, R.I.

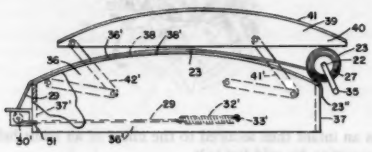
Filed Apr. 30, 1979, Ser. No. 34,940
Int. Cl.³ B66C *1/42*
U.S. Cl. 294—88 **7 Claims**



1. A device for driving a pair of jaws pivotally supported from a housing towards and away from each other, said jaws each including an upwardly oriented head from which a leg downwardly depends, said heads and said legs having inner respectively opposed surfaces, an arcuate recess formed in each such inner opposed head surface said recesses cooperatively forming a drive socket, a generally cylindrical bushing laterally disposed between said jaws and supported in said socket and disposed in slidable face to face contact with the opposed surfaces of said recesses, said bushing including terminal ends laterally extending past the opposite sides of said jaws and drive means connected to said bushing ends for reciprocating said bushing up and down with respect to said housing so as to force said jaws to pivotally move towards and away from each other, said drive means including a drive member having segments disposed on either side of said jaws and adapted to receive said bushing ends therein, said housing including a generally centrally disposed vertically oriented bore, said drive member passing through said bore and adapted for reciprocal movement relative thereto, said recesses downwardly spaced from the upper terminus of said head so as to define opposed upper head inner surfaces and stop means adapted to contact one of said upper head inner surfaces so as to directly

limit the extent of pivotal movement of said jaws relative to each other.

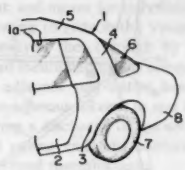
4,234,224
TRUCK BOX COVER DEVICE
Leo Rosenvold, Wildrose, N. Dak.
Filed Nov. 13, 1978, Ser. No. 959,566
Int. Cl.³ B60J 7/08
U.S. Cl. 296—98 **1 Claim**



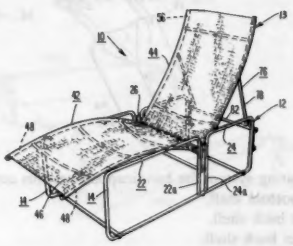
1. A truck box cover device for attachment to the top of a truck box having side walls and end walls, said device comprising an elongated movable rod positioned adjacent one end of said box and extending across the truck box from above one side wall to a position above the other side wall, a rectangular tarp having one edge attached to said rod and its side edges extending over the side walls with said other end of said tarp fixed to the other end of said box to thereby cover said box, a pulley cable winding means mounted on the ends of said rod for winding and unwinding the cable thereon and movable with said rod means, cable guide means on each side of said box adjacent the one end of said box, a cable on each respective side of said box attached to said cable pulley winding means at their one end and extending from said cable winding means toward and around said cable guide means and fixed at their other ends to said box, each of said cables having spring tension means to provide tension on said cable tending to draw said cable winding pulley means on said rod, and said tarp on said rod toward said one end of said box, means on said rod to rotate said rod, said rotation of said rod in one direction causes said rod and said portion of said tarp on said rod to move by rolling on the top of said box toward said other end of said box and to roll said tarp onto said rod by winding the tarp extending towards the other end of the box onto the rod from beneath the rod, thereby opening the top of the box, the cable winding means moving with the rod and unwinding cable extending to the one end of the box from beneath the rod with the spring tension on the cables acting to keep the tarp taut, and whereby rotating the rod in the opposite direction causes said rod and said portion of said tarp to move by rolling on the top of the box toward the one end of the box, unrolling said tarp from said rod by unwinding said tarp extending towards the other end of the box from beneath the rod, the cable winding means moving with the rod and winding the cable extending to the one end of the box from beneath the rod with the spring action on the cables acting to keep the tarp taut.

4,234,225
REAR REINFORCEMENT STRUCTURE FOR AUTOMOBILE BODIES
Hayatsugu Harasaki, and Isao Teramoto, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan
Filed Aug. 1, 1979, Ser. No. 62,799
Claims priority, application Japan, Aug. 3, 1978, 53-107122
Int. Cl.³ B62D 25/02
U.S. Cl. 296—185 **7 Claims**

1. An automobile body comprising side door openings formed at the opposite sides thereof, rear side structures extending rearwardly from said door openings and having front ends formed with seating means for receiving rear edges of door panels which are mounted on the body, each of said rear side structures including rear side panel means, rear pillar means extending from the rear side panel means upwardly to roof means of the body, transverse reinforcement means extending between the rear side panel means of the opposite rear side structures rearwards of the rear pillar means, longitudinal reinforcement means attached to each rear side panel means and extending rearwardly from the seating means, said longitudinal reinforcement means extending rearwardly beyond said rear pillar means to the transverse reinforcement means and connected with both said rear pillar means and the transverse reinforcement means at longitudinally spaced portions.



4,234,226
ADJUSTABLE AND COLLAPSIBLE SEATING PIECE
Donald B. Colby, Los Angeles, Calif., assignor to Scott Paper Company, Philadelphia, Pa.
Filed Oct. 2, 1978, Ser. No. 947,644
Int. Cl.³ A47C 4/00
U.S. Cl. 297—21 **7 Claims**

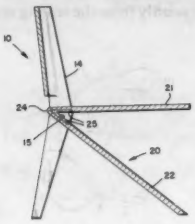


1. A seating piece comprising:
a foldable base unit including lower support members and side frame members, said side frame members being rotatable into a generally horizontal, collapsed position, and into a laterally spaced-apart, generally vertical position;
a seating unit including a seat section and a back section rotatably joined together to permit said seat and back sections to be adjusted relative to each other, said seating unit including connecting means for releasably engaging side frame members when said side frame members are in their generally vertical position for releasably connecting the seating unit to the base unit without preventing rotational movement between the seat and back sections.

4,234,227
COLLAPSIBLE CHAIR
John A. Faust, 3921 Bentley Ave., Culver City, Calif. 90230
Filed Jun. 4, 1979, Ser. No. 45,120
Int. Cl.³ A47C 7/00
U.S. Cl. 297—443 **4 Claims**

1. A collapsible chair comprising:
a unitary backrest and rear leg portion having a compressible brace transversing the width of the unitary structure; and a reversed seven-shaped seat and frontal leg portion

being compatible with the transverse brace portion of the backrest rear leg portion so as to interact with the compressible brace to form an interlocking sleeve, whereby a secure chair structure is formed.



4,234,228

MODULAR ARTICULATING SEATING SYSTEM FOR THE HANDICAPPED

Jonathan A. Flamm, 1174 N. Curson St., #7, Los Angeles, Calif. 90046

Filed Aug. 25, 1978, Ser. No. 936,812
Int. Cl.³ A47C *31/00*; A62B *35/00*
U.S. Cl. 297—464 **7 Claims**

1. A seating system for handicapped persons comprising:
a seat bottom shell;
a lower back shell;
an upper back shell;
a pair of first joint means coupling said lower back shell to said seat bottom shell, for permitting both pivoting and sliding of said lower back shell with respect to said seat bottom shell; and
a pair of second joint means coupling said upper and lower back shells, for permitting both pivoting and sliding of said back shells with respect to each other; and locking at a plurality of relative positions permitted by such pivoting and sliding.

4,234,229

SAFETY HARNESS FOR INFANTS

Jonathan H. Arnold, 609 5th St., Berthoud, Colo. 80513

Filed Apr. 6, 1979, Ser. No. 27,759
Int. Cl.³ A47C *31/00*
U.S. Cl. 297—467 **6 Claims**

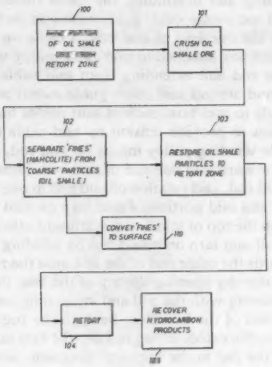
1. The two party harness for use in combination with a lap belt to hold an infant in face-to-face relation against the chest of a seated adult which comprises: a fabric panel of a size and shape effective to cover the back and rump of an infant child, belt-receiving means depending from said panel for detachably connecting same to a lap belt, a first strap subassembly carried by said panel effective to detachably fasten the latter to the infant's back, and a second strap subassembly carried by said panel for detachably securing same in slack relation to the chest of an adult, said belt-receiving means and first strap subassembly cooperating to detachably secure the infant to the lap belt, and said second strap subassembly being effective to harness an infant thus secured to the chest of an adult held in seated position by said lap belt.

4,234,230

IN SITU PROCESSING OF MINED OIL SHALE

Bernard E. Weichman, Houston, Tex., assignor to The Superior Oil Company, Houston, Tex.

Filed Jul. 11, 1979, Ser. No. 56,595
Int. Cl.³ E21C *41/10*
U.S. Cl. 299—2 **11 Claims**



1. A method of recovering products from a nahcolitebearing oil shale ore deposit comprising the steps of:
(a) defining a retort zone within the deposit;
(b) mining the nahcolite-bearing oil shale ore from the retort zone;
(c) crushing the mined oil shale ore to form particles comprising substantially nahcolite and particles comprising substantially oil shale;
(d) separating the substantially nacholite particles from the substantially oil shale particles to recover a substantially nahcolite product;
(e) restoring the oil shale particles to the retort zone; and
(f) retorting the oil shale particles to recover hydrocarbon products.

4,234,231

METHOD FOR RESTORING A LEACHED FORMATION

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

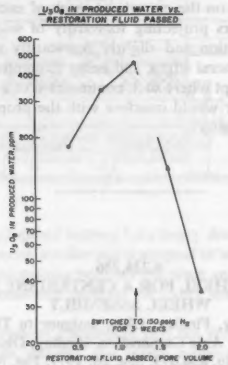
Filed Dec. 6, 1978, Ser. No. 966,933
Int. Cl.² E21B *43/28*
U.S. Cl. 299—4 **12 Claims**

1. A method of restoring a formation which has had mineral and/or metal values therein oxidized by an oxidant during an

in situ leach operation, said formation having at least one injection well and at least one production well completed therein, said method comprising:

a. shutting in said at least one injection well and said at least one production well at the completion of said in situ leach operation, said wells being shut in for a period necessary to exhaust any unreacted said oxidant that may be present in said formation;

b. producing at least one pore volume of fluid from said formation at the end of said shut in period of step a.;


U_3O_8 IN PRODUCED WATER VS. RESTORATION FLUID PASSED
U_3O_8 in PRODUCED WATER, ppm
SWITCHED TO 150 psig H_2 FOR 3 WEEKS
RESTORATION FLUID PASSED, PORE VOLUME

c. injecting into said formation at least one pore volume of a restoration fluid containing a reducing agent capable of reducing said oxidized mineral and/or metal values to their reduced, insoluble state;

d. shutting in said at least one injection well and said at least one production well for a period necessary to provide the reaction time for the reduction of said oxidized mineral and/or metal values; and

e. injecting deaerated water into said formation and producing fluids from the formation until the concentration of oxidized mineral and/or metal values in the produced fluids reach a desired level.

4,234,232

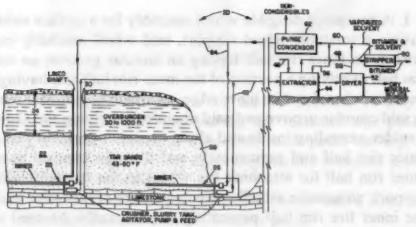
METHODS OF AND APPARATUS FOR MINING AND PROCESSING TAR SANDS AND THE LIKE

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 825,762, Aug. 18, 1977, abandoned, which is a division of Ser. No. 662,890, Mar. 1, 1976, Pat. No. 4,067,616, which is a continuation-in-part of Ser. No. 460,558, Apr. 12, 1974, Pat. No. 3,941,679. This application Oct. 4, 1978, Ser. No. 948,554

Int. Cl.[2] **E21C** *41/10*

U.S. Cl. 299—5 **5 Claims**



1. Apparatus for mining tar sands and the like which includes: a cutter head; a hollow shaft for rotating said cutter head, said shaft being fixed at one end thereof to said cutter head; at least one helical conveyor flight distinct from said cutter head and surrounding said shaft for conveying dislodged material away from said cutter head, said conveyor flight extending from said one end of said shaft toward the other end thereof; a casing surrounding said conveyor flight and extending from said one end of said shaft toward the other end thereof through which dislodged material can be propelled by said conveyor flight; and means for introducing a non-aqueous solvent into said casing to reduce the viscosity of the mined material being conveyed therethrough by said helical conveyor flight, said last mentioned means comprising openings in said hollow shaft adjacent said cutter head and means for circulating said non-aqueous solvent to and through said shaft and for then effecting a discharge of the solvent through said openings into said casing and into contact with the mined material being conveyed therethrough.

4,234,233

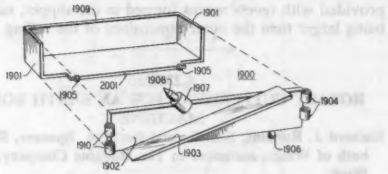
CHAIN DRIVEN CUTTING BUCKET FOR USE IN DEEP MINING

Robert L. Hurd, 2063 Manor Dr., Lexington, Ky. 40502, and Donald C. MacGregor, 13 Hunters Trail, Warren, N.J. 07060

Filed Feb. 21, 1979, Ser. No. 13,750

Int. Cl.[3] **E21C** *35/20*

U.S. Cl. 299—34 **8 Claims**



1. A bucket for chipping coal from a coal seam, said bucket having two sides, a front, a back, and a bottom, each of said sides having an inner surface facing the inside of said bucket and an outer surface facing outward from said bucket,

means for hinging said bottom to a first one of said sides at a bottom surface of said first side,

a first set of hinges at the leading edge of said first side,

a second set of hinges at the trailing edge of said first side, said second set of hinges positioned so as to flexibly engage the first set of hinges of a trailing one of said buckets,

a ramp affixed to said outer surface of said first side, and sloping upward from said leading edge to said trailing edge of said first side, the top end of said ramp extending beyond the top surface of said first side,

a cutting assembly mounted on said outer surface of said first side, said assembly adapted for chipping coal from a coal seam coming into contact therewith, and

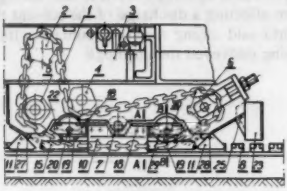
wherein said second side, said front, said back and said bottom are rigidly affixed to each other to form a bucket assembly for receiving said chipped coal and wherein said first side is flexibly attached to said bottom by said bottom hinge in a manner such that when upward pressure is placed under said bottom said bucket will contain any coal placed therein and such that when said upward pressure is removed from said bottom said bucket assembly will tilt away from said first side, spilling said contained coal.

4,234,234

DRIVING DEVICE FOR A MINING MACHINE

Janusz Sedlaczek, Gliwice; Andrzej Blazewicz, Tychy; Jacek Cyrulo, Sosnowiec; Marian Krutki, and Tadeusz Wozniak, both of Katowice, all of Poland, assignors to Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych Komag, Gliwice, Poland

Filed Feb. 28, 1979, Ser. No. 16,028
Claims priority, application Poland, Mar. 15, 1978, 205358
Int. Cl.[3] E21C *29/02*
U.S. Cl. 299—43 4 Claims



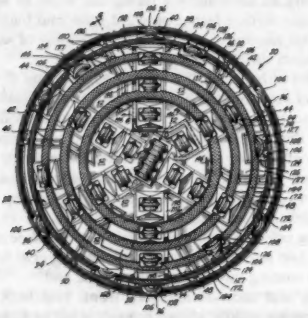
1. An improved device for driving a mining machine which shifts on a conveyor, especially for driving a combine, said device being comprised of, an endless link chain, said chain being extended between a toothed drive wheel and a toothed reversible wheel which are fixed to a combine; a rack fixed alongside the conveyor, said rack is in mesh with said chain and maintained in said mesh by means of a slide skid provided with riding wheels at both its ends; a slipper, said slipper being fixed to the combine and provided with a circular recess enclosing a railing fixed to said conveyor along its whole length, said improvement comprising: having the riding wheels mounted on cranks of axles fixed in the combine, and being provided with recess means formed in the slipper, said recess being larger than the outer dimensions of the railing.

4,234,235

ROTARY CUTTERHEAD FOR AN EARTH BORING MACHINE

Richard J. Robbins, Seattle, and Barry A. Spencer, Redmond, both of Wash., assignors to The Robbins Company, Seattle, Wash.

Filed Feb. 5, 1979, Ser. No. 9,170
Int. Cl.[3] E21D *9/10*
U.S. Cl. 299—56 28 Claims



1. A rotary cutterhead for an earth boring machine, comprising:

a. a main frame having a forward section and a rearward section by which rearward section the cutterhead is mounted onto an earth boring machine for rotation about an axis of rotation;

b. a plurality of roller cutters and cutter mounting means for mounting said roller cutters within said main frame forward section, each of said roller cutters having peripheral cutting edge portions projecting forwardly of said main frame forward section to cut concentric kerfs upon rotation of the cutterhead;

c. a plurality of cut-ground-material passageways formed in said main frame forward section and disposed between said roller cutters, and extending through said main frame; and,

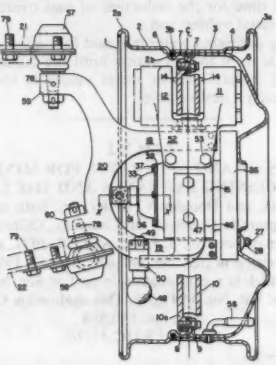
d. a plurality of radially spaced apart face-support-ring members located on the cutterhead, each of said face-support ring members projecting forwardly of said main frame forward section and slightly rearwardly of said roller cutter peripheral edges, and being circumferentially continuous except where such continuation of a face-support-ring member would interfere with the proper placement of a roller cutter.

4,234,236

TWO PIECE WHEEL FOR A CENTERLINE STEERING WHEEL ASSEMBLY

Melvin R. Inbody, Findlay, Ohio, assignor to The Centerline Steering Axle Corporation, Findlay, Ohio

Division of Ser. No. 836,673, Sep. 26, 1977, Pat. No. 4,159,832, which is a continuation of Ser. No. 638,069, Dec. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 492,438, Jul. 29, 1974, Pat. No. 3,963,260. This application Oct. 10, 1978, Ser. No. 949,684
Int. Cl.[3] B60B *23/10*
U.S. Cl. 301—6 W 6 Claims

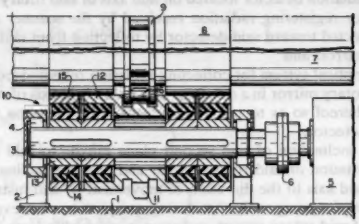


1. A two piece dirigible wheel assembly for a surface vehicle having a rotatable wheel support, said wheel assembly comprising: an inner rim half having an annular groove; an outer rim half overlying a portion of the inner rim half and having an undercut chamfer at its inner edge; an elastic O-ring seal seated in said annular groove and said chamfer overlying the O-ring; a spider extending inside and along the inner periphery of the outer rim half and permanently and directly secured to said outer rim half for attaching the wheel to the rotatable wheel support; an annular radially directed flange at the outer end of the inner tire rim half presenting an outwardly directed surface; an annular radially directed mating flange at the inner end of said spider presenting an inwardly directed surface; an annular element adjacent the flanges; and means for releasably fastening said mating flanges and said annular element together.

4,234,237
BEARING FOR HEAVY STEEL DRUMS, IN PARTICULAR DECORTICATING DRUMS

Kiriazis Kiriazaros, Graz, Austria, assignor to Maschinenfabrik Andritz Aktiengesellschaft, Austria

Filed Mar. 29, 1977, Ser. No. 782,559
Int. Cl.[3] F16C 27/00
U.S. Cl. 308—26 2 Claims



2. In a shock-proof bearing for a heavy drum which is rotatably supported on a roller and is adapted to be driven by a gear drive, the axial spacing between the drum and the roller or the gear drive remaining constant for every spring-support position,

the improvement comprising that the roller and a driving pinion are integral, and spring support means mounted between a casing of the roller and a hub thereof, said spring support means being a plurality of sheathed, spoke-like resilient inserts equidistantly mounted to the hub in a star-shaped configuration,

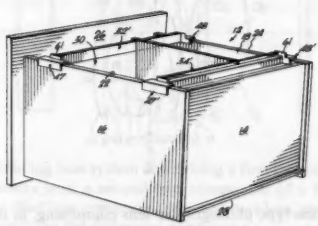
sheathed support components positioned in the cavities of said resilient inserts and secured to the interior of the roller casing,

and said sheathed resilient inserts being capable of radial displacement.

4,234,238
FILE SUPPORT STRUCTURE FOR DRAWER

Ruben Figueroa, 75 E. 13 St., Hialeah, Fla. 33010

Filed Apr. 18, 1979, Ser. No. 31,184
Int. Cl.[3] A47B 63/00
U.S. Cl. 312—184 10 Claims



1. A file support structure for use on drawers of a type having front, rear, and side panels, the rear and side panels having generally common thickness, each panel having an upper terminal edge and the edges in generally common plane, the structure comprising:

the combination of a pair of guide tracks and a first and second adjustable channel adapter pairs,

each adapter comprising a channel including a middle portion defining a web and downwardly extending legs adapted for abutting engagement with the side panel terminal edge, the channel including a middle inner portion having an inwardly extending channel and an upper portion defining an ear stop means for limiting movement adjacent the inwardly extending middle portion,

each guide track comprising a channel of predetermined length with a middle portion defining a web and downwardly extending legs adapted for connection with the inwardly extending middle portion of the channel adapter, the track including an upwardly extending flange defining a rail along the track for hooked-up connection with the file,

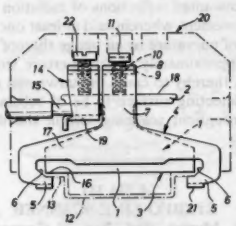
each pair of adapters adapted for opposed connection on either side of the side panel terminal edge and the pairs spaced apart a predetermined common distance, and

the guide tracks adapted for spanning a respective pair of adapters.

4,234,239
EARTHING TERMINAL

Manfred Wilmes; Rudiger Obst, and Wolfgang Kretzschmar, all of Detmold, Fed. Rep. of Germany, assignors to C. A. Weidmuller KG, Detmold, Fed. Rep. of Germany

Filed Nov. 20, 1978, Ser. No. 962,491
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 7811403[U]
Int. Cl.[3] H01R 9/26
U.S. Cl. 339—198 GA 5 Claims



1. An earthing terminal adapted to be mounted on a supporting rail having a channel section with oppositely directed outwardly turned flanges, comprising

(a) a metal member for connection to a conductor and adapted to rest on the upper surfaces of said flanges;

(b) a unitary rigid yoke of sheet metal, shaped to form

(i) a pair of hook portions for engagement with the undersides of respective ones of said flanges of said support rail, each hook portion facing a respective surface portion of said metal member;

(ii) two wall portions between which said metal member is disposed; and

(iii) respective lugs upstanding from said wall portions and having their free ends bent towards one another with one overlying the other and overlying and spaced from said metal member, said free ends having aligned screw threaded bores therein; and

(c) a clamping screw threaded in said bores and extending towards said metal member, the tip of said clamping screw abutting the upper surface of said member;

(d) whereby, on tightening of said screw, said screw will advance toward said metal member, whereby said metal member and said yoke will be relatively moved for clamping said support rail flanges between said hook portions and said facing surface portions of said metal member.

4,234,240
OPTICAL SCANNING SYSTEM WITH UNWANTED REFLECTIONS CONTROLLED

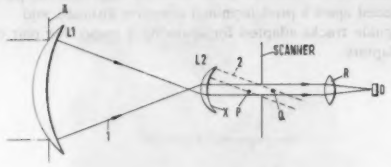
William T. Moore, and Michael T. Sweeney, both of London, England, assignors to The Rank Organization Limited, London, England

Filed Feb. 2, 1977, Ser. No. 764,987

Claims priority, application United Kingdom, Feb. 2, 1976, 4075/76

Int. Cl.³ G02B *27/19*

U.S. Cl. 350—6.1 **11 Claims**



1. In a thermal imaging system comprising scanning means for effecting scanning of a distant scene, a first optical sub-system for collimating radiation from the distant scene and directing the resultant collimated beam on to the scanning means, a detector having a detecting surface, a second optical sub-system for directing radiation from the scanning means to be incident on the detecting surface of the detector effectively normal to said surface, and means defining an aperture stop for passing all the rays from the distant scene to be scanned within a defined field of view, the optical sub-systems comprising optical elements bearing at least one optical surface which gives rise to unwanted reflections of radiation within the system; the improvement wherein said at least one optical surface has its center of curvature or an image thereof in a fixed location at least approximately at the aperture stop means or an image thereof, thereby to cause the unwanted reflections incident on the detecting surface to be of substantially uniform magnitude throughout scanning within the defined field of view.

4,234,241
STEREO LINE SCANNER

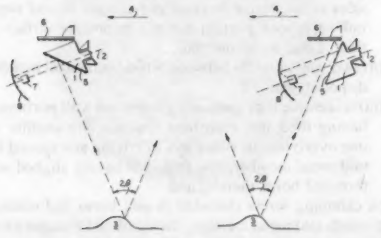
Erich Schmidt, Munich, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Köln-Porz, Fed. Rep. of Germany

Filed Jul. 23, 1979, Ser. No. 59,660

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1978, 2833808

Int. Cl.³ G02B *27/17*

U.S. Cl. 350—6.9 **7 Claims**



1. A stereo line scanner for optical radiation reception and recording to enable provision of stereoscopic picture-like representation of remote objects from a moving instrument carrier, comprising in combination:

a rotary plane mirror provided with means for causing it to revolve about an axis at an angle of substantially 45° to its mirror plane,

a second plane mirror in the vicinity of the periphery of said rotary mirror and having an elongated mirror surface of which the long dimension is oriented at right angles to the axis of revolution of said rotary mirror and of which the short dimension is oriented at an angle between 0° and 45° to said axis of said rotary mirror,

a radiation detector located on said axis of said rotary mirror for registering radiation received by the scanner and directed toward said detector by reflection from said rotary mirror, and

an optical system for collecting radiation reflected from said rotary mirror in a direction parallel to said axis of rotation thereof so as to provide said collected radiation to said detector,

the inclination of said second plane mirror to said axis of rotation of said rotary mirror and also the inclination of said axis to the direction of movement of said instrument carrier being such, that during one portion of a revolution of said rotary mirror, radiation is receivable from objects disposed on the opposite side of said axis from said second mirror in a beam of primary rays reflected directly by said rotary mirror toward said optical collecting system and during another portion of said revolution of said rotary mirror, radiation is receivable from objects so disposed in a beam of secondary rays reflected first by said second plane mirror and then again by said rotary mirror to proceed toward said optical collecting system and said detector, whereby a line scan of said secondary rays can be correlated with a line scan of said primary rays from the same objects, but taking place after an interval determined by the movement of said carrier past said objects, to provide stereoscopic data regarding the aspect and disposition of said objects.

4,234,242
GAUSS TYPE PHOTOGRAPHIC LENS

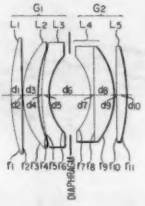
Soichi Nakamura, Kamakura, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 30, 1979, Ser. No. 7,775

Claims priority, application Japan, Feb. 3, 1978, 53-10525

Int. Cl.³ G02B *9/60*

U.S. Cl. 350—218 **5 Claims**



1. A Gauss type photographic lens comprising, in the order from the object side, a positive lens component, a positive meniscus lens component having its convex surface facing the object side, a negative meniscus lens having its convex surface facing the object side, a diaphragm, a meniscus lens component comprising a negative lens and a positive lens cemented together and having its concave surface facing the object side, and a positive lens component, wherein the total focal length of the entire system is f, the lens components adjacent to the object side with respect to the diaphragm forms a first convergent lens group having a composite focal length f_1, and the lens components adjacent to the image side with respect to the diaphragm forms a second convergent lens group having a composite focal length f_2, said photographic lens satisfying the following two conditions:

$$0.9f < D < 1.05f \quad (a)$$

$$2.5f < f_1 < 3.0f \quad (b)$$

where D is the distance between the principal points of said two lens groups, said photographic lens further satisfying the following conditions:

$$0.06f_1 < D_1 < 0.08f_1 \quad (c)$$

$$0.16f_2 < D_2 < 0.18f_2 \quad (d)$$

$$\frac{n_3}{n_2} \cong \frac{n_4}{n_5} \quad (e)$$

$$\left.\begin{array}{l} 1.62 < \dfrac{n_3 + n_4}{2} < 1.70 \\ 27 < \nu_3, \nu_4 < 37 \end{array}\right\} \quad (f)$$

$$\left.\begin{array}{l} 1.70 < n_1, n_2, n_5, n_6 < 1.90 \\ 40 < \nu_1, \nu_2, \nu_5, \nu_6 < 55 \end{array}\right\} \quad (g)$$

$$0.2f_1 < r_4 < 0.3f_1 \quad (h)$$

$$0.5f_1 < r_5 < 0.7f_1 \quad (i)$$

$$0.31f_2 < |r_7| < 0.37f_2 \quad (j)$$

$$r_8 < 0 \quad (k)$$

$$|3r_7| < |r_8|$$

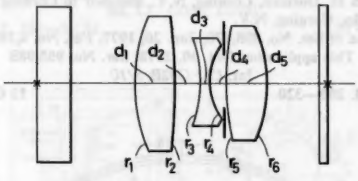
where D1 represents the length from the foremost lens surface to the rearmost lens surface of the first convergent lens group, D2 the length from the foremost lens surface to the rearmost lens surface of the second convergent lens group, r the curvature radius of each lens surface, n and ν represent the refractive index and the Abbe number, respectively, of each lens, and subscript numbers represent the order from the object side.

4,234,243

REDUCING LENS SYSTEM

Hiroshi Takase, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1979, Ser. No. 7,589
Claims priority, application Japan, Feb. 7, 1978, 53/12693
Int. Cl.³ G02B 9/16
U.S. Cl. 350—226 **6 Claims**



1. A reducing lens system comprising a first lens component of a biconvex lens, a second lens component of a biconcave lens and a third lens component of a biconvex lens, the said lens system satisfying the following conditions:

(1)	$1.73 > n_3 \cong n_1 > 1.63$ $1.65 > n_2 > 1.59$
(2)	$61 > \nu_1, \nu_3 > 54$ $36 > \nu_2 > 33$
(3)	$0.76f > f_1 > 0.71f$ $-0.30f > f_2 > -0.35f$ $0.48f > f_3 > 0.44f$
(4)	$0.14f > d_1, d_2, d_5 > 0.11f$ $0.51f > \Sigma d > 0.48f$
(5)	$0.52f > r_1 > 0.49f$ $-6.2f > r_2 > -17.0f$ $-0.43f > r_3 > -0.48f$ $0.38f > r_4 > 0.32f$

-continued

	$1.32f > r_5 > 1.12f$ $-0.39f > r_6 > -0.44f$

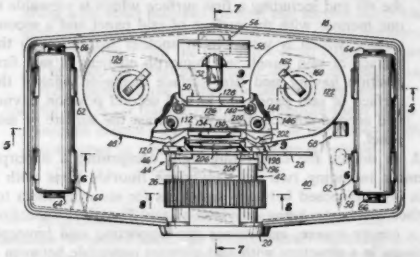
wherein the reference symbols n_1 through n_3 represent the refractive indices of the respective lenses, the symbols ν_1 through ν_3 represent the Abbe numbers of the respective lenses, the symbols f_1 through f_3 represent the focal length of the respective lenses, the symbols d_1 and d_5 represent the axial thicknesses of the first and third lens components, the symbol d_2 represents the axial air space between the first and second lens components, the symbol Σd represents the total length of the lens system, the symbols r_1 through r_6 represent the radii of curvature of the respective lens surfaces and the symbol f represents the focal length of the total lens system, respectively.

4,234,244

PORTABLE MICROFILM VIEWER

Jeshayahu Klein, 212 Rutledge St., Brooklyn, N.Y. 11211

Filed Dec. 1, 1977, Ser. No. 856,358
Int. Cl.³ G02B 27/02
U.S. Cl. 350—241 **22 Claims**

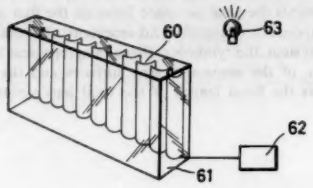


1. A portable microfilm viewer for directly viewing microfilm comprising a housing, a lens system mounted in said housing, film transport means secured in said housing for removably receiving and supporting thereon a film cassette containing a microfilm, drive means fixedly mounted on said housing, said drive means having a rotary output, and bidirectional engaging means, fixedly mounted on said housing, for coupling said rotary output of said drive means to said film transport means for selectively transporting the film of the cassette in either of two directions across said lens system for said direct viewing and wherein said film cassette comprises a closed casing having a pair of laterally spaced apart cyclindrical chambers, and a channel interconnecting said chambers said channel having front and rear windows therein, a film spool respectively positioned in each chamber, coupling means on said film spools for retaining said spools on said transport means for thereby supporting said cassette and for drivingly interconnecting said spools with said transport means, and guide means in said channel for guiding film from one spool to the other along a path in opposition to said front window and wherein said casing further comprises lens means positioned in said front window and a translucent material positioned in said rear window, and drag means coupled to said film spools for retarding unwinding of film from said film spools.

4,234,245
LIGHT CONTROL DEVICE USING A BIMORPH ELEMENT

Minoru Toda, and Susumu Osaka, both of Machida, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,538
Claims priority, application United Kingdom, Apr. 22, 1977, 16839/77; May 26, 1977, 22263/77; May 26, 1977, 22266/77
Int. Cl.[3] G05D 25/02; G09F 3/04, 9/37
U.S. Cl. 350—269 3 Claims



1. A device for controlling light comprising a bimorph element including two polyvinylidene fluoride films with a thin layer disposed between said films for securing them together, electrodes being provided on said films for connection to a power source, and means for supporting said bimorph element in a structure with said element moveable between a first position and a second position in accordance with the application of an electric field from said source to thereby control the passage of light,

said structure comprising a panel with a slit formed in the panel, said bimorph element being moveably inserted into the slit and including a first surface which is viewable in one manner with the surface of said panel and a second surface which is viewable in another manner with the surface of said panel, said bimorph element in said first position having said first surface displayed against the surface of said panel and in said second position having said second surface displayed against the surface of said panel.

3. A device for controlling light comprising a bimorph element including two polyvinylidene fluoride films with a thin layer disposed between said films for securing them together, electrodes being provided on said films for connection to a power source, and means for supporting said bimorph element in a structure with said element moveable between a first position and a second position in accordance with the application of an electric field from said source to thereby control the passage of light,

said structure comprising parallel transparent members and a mounting member disposed between said transparent members, one edge of each of a plurality of said bimorph elements being fixed to said mounting member with the free end of each bimorph element in said first position overlapping said fixed edge of an adjacent bimorph element and with the free end of each bimorph element in said second position being spaced from said fixed edge of said adjacent bimorph element.

4,234,246
REMOTE CONTROLLABLE REARVIEW MIRROR

Erich Wunsch; Udo Wunsch, and Eckart Wunsch, all of Im Hofrain 12,, D-7141 Schwieberdingen, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,284
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741290
Int. Cl.[3] G02B 7/18
U.S. Cl. 350—289 15 Claims

1. A remote controllable adjusting setting device with rearview mirros, comprising

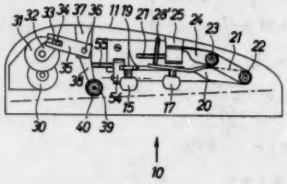
a mirror housing,

a mirror plate,

control means for acting on said mirror plate, said control means being controllable from a remote position,

means constituting pivotal articulations for suspending said mirror plate to said housing without play on at least two suspension points, respectively, each said articulations constituting ball and socket joints, said suspension points being arranged spaced from one another, all said articulations having one part of said ball and socket joints directly mounted on said mirror plate,

the other part of one of said ball and socket joints of one of said articulations of one of said suspension points being stationary and is rigidly connected with said mirror housing, the other part of the other of said ball and socket



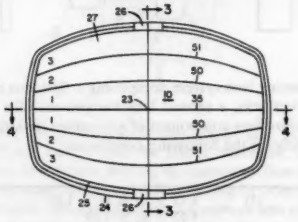
joints of the other of said suspension points being displaceable relative to said mirror housing,

swingable arm means for absorbing external forces respectively connected to said other part of said ball and socket joints of the other of said suspension points, respectively, and to said housing and including frictional restraining means for guidably constraining said other part of said ball and socket joints of said other suspension points in a pivot plane thereof through the stationary one of said suspension points and for simultaneously holding said mirror plate fixed relative to said housing against external vehicle movement forces, said ball and socket joints being frictionless relative to said frictional restraining means, said control means for operatively overcoming said frictional restraining means.

4,234,247
METHOD OF MAKING A REFLECTOR

William H. Dorman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 808,170, Jun. 20, 1977, Pat. No. 4,149,227.
This application Oct. 30, 1978, Ser. No. 955,985
Int. Cl.[3] G02B 5/10
U.S. Cl. 350—320 12 Claims



1. A method of fabricating a reflector surface for delivering reflected illumination from a light source at one focus of the reflector surface to a limited zone of illumination comprising:

selecting a plurality of sector surfaces from various areas of at least one ellipsoidal base surface, each section having a selected surface curvature;

aligning each sector one next to the other, rotating each surface relative to the aforementioned focus thereof so as to align the reflected illumination at a corresponding

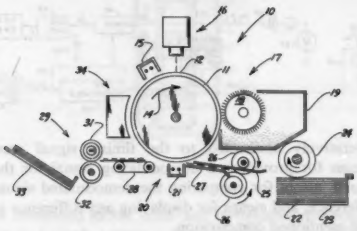
portion of the limited zone of illumination and forming the said aligned surfaces into a continuous surface such that said reflected illumination forms an elongated light pattern.

4,234,248

HOT ROLL FUSER

Christian A. Beck, Ridgefield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 4, 1979, Ser. No. 45,169
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 FU 9 Claims



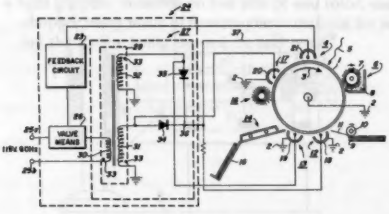
1. In an electrostatic copying machine in which the fusing apparatus for fixing toner images to a support surface comprises a heated fuser member in pressure contact with a backup member, and fusing is accomplished by passing the support surface with the toner images thereon between the heated fuser member and backup member thereby applying heat and pressure to the toner image, an improved roll type fuser member whose outer surface comprises graphite, said graphite comprising less than about 0.5 percent by weight carbon.

4,234,249

TRACKING POWER SUPPLY FOR AC AND DC COROTRONS

Donald J. Weikel, Jr., Rochester, N.Y., and John Hartman, Reseda, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1978, Ser. No. 956,780
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 CH 32 Claims



1. A tracking power supply circuit for a mixture of AC and DC corotrons comprising

means for generating a pulsating DC voltage from an AC voltage having a wave shape corresponding to the wave shape of the AC voltage,

means for coupling the pulsating DC voltage to a DC Corotron,

means for coupling an AC voltage having corresponding wave shape to an AC corotron and

feedback means coupled to only one of the corotrons and valve means for varying all the AC and pulsating voltages coupled to the corotrons.

4,234,250

ELECTROPHOTOGRAPHIC PRINTING SYSTEM

Louis D. Mailloux, Webster, and William M. Reilich, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 15, 1977, Ser. No. 816,126
Int. Cl.³ G02B *27/17*
U.S. Cl. 355—4 8 Claims

1. Electrophotographic composite printing apparatus comprising

a recyclable photoconductive member and charging means for uniformly, electrostatically charging the surface of the photoconductive member each cycle of the member in preparation for creation of a latent electrostatic image each cycle subsequent to the uniform charging of the surface of the photoconductive member,

composite exposure means for exposing to electromagnetic radiation the charged surface of the photoconductive member for creation of latent electrostatic images thereon, the composite exposure means including optical projection means for exposing a first selected region of the uniformly charged surface during a cycle of the photoconductive member to an electromagnetic radiation image of an original projected onto the first selected region by means including a projection lens for creating a first latent electrostatic image and laser exposure means for exposing a second nonoverlapping region of the charged surface, during the same cycle of the photoconductive member that the first region is exposed, to a data controlled raster scan image created by a moving spot of electromagnetic radiation generated by a laser for creating a second latent electrostatic image which with the first latent image comprises a composite latent electrostatic image,

development means for substantially simultaneously developing with toner material the first and second latent electrostatic images during the same cycle of the photoconductive member that the first and second charged regions are exposed for creating a visible composite toner image corresponding to the composite latent image and

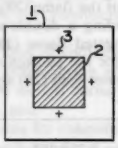
transfer means for transferring the composite toner image to a support member during the cycle of the photoconductive member in which the toner image is created.

4,234,251

AUTOMATIC PICTURE MASKING DEVICE

Fumihiko Nishida, Kyoto, and Hiroshi Ijiri, Nagaokakyo, both of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 29, 1979, Ser. No. 24,975
Claims priority, application Japan, Mar. 31, 1978, 53-37836
Int. Cl.³ G03B *27/58*
U.S. Cl. 355—74 7 Claims



1. In a composer having an original picture holder which includes a transparent plate against which an original picture and masking register marks are to be held during the use of the composer, an automatic masking device comprising a plurality of opaque masking sheets each being adapted to move along the surface of the transparent plate to selective masking positions of the original picture; drive means for moving said masking sheets; and a plurality of detectors mounted on at least some of said masking sheets for controlling said drive means,

each detector including means for directing light at and for detecting light reflected from said register marks.

4,234,252

APPARATUS FOR THE SIMULTANEOUS PHOTOMETRIC DETERMINATION OF A PLURALITY OF ELEMENTS IN A LIQUID SAMPLE

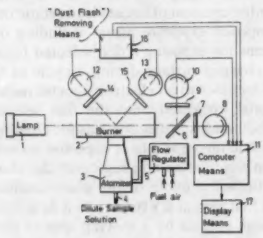
Klaus Böttger, Oberkochen; Dieter Müller, Königsbronn; Karl-W. Schmekel, Oberkochen, and Walter Tausch, Aalen, all of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Jan. 12, 1979, Ser. No. 3,124

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1978, 2802147

Int. Cl.³ G01N *21/72*

U.S. Cl. 356—73 **10 Claims**



1. Apparatus for the simultaneous photometric determination of a plurality of elements in a liquid sample in which each of the elements to be determined has a receiver associated with it and the signals supplied by said receivers are evaluated via a computer, characterized by the combination of the following elements:

(a) at least one hollow-cathode lamp (**1**) whose light contains at least one narrow-band emission line of one of the elements to be determined;

(b) a burner (**2**) for producing an elongated flame (**28**) to which the diluted liquid sample is fed via an atomizer (**3**);

(c) photoelectric receivers (**12, 13**) arranged laterally of the flame (**28**) for measurement in emission;

(d) photoelectric receivers (**8, 10**) arranged behind the flame (**28**) for measuring the radiation of the hollow-cathode lamp (**1**) which penetrates the flame (**28**) in longitudinal direction;

(e) narrow-band filters (**7, 9, 14, 15**) arranged in front of each receiver (**8, 10, 12, 13**) for the passage of a line characteristic of the specific element to be determined;

(f) an arrangement (**16**) for the electronic removal of dust flashes in the flame, said dust-flash removal arrangement being connected to said photoelectric receivers (**12, 13**) arranged laterally of the flame (**28**);

(g) said burner including a double-wall stack (**27**) which surrounds the elongated flame (**28**), one side of which contains openings for the passage of the outer air in the lower part of the outer wall (**29**) and in the upper part of the inner wall (**30**).

4,234,253

ATTENUATION MEASURING SYSTEM

John W. Higginbotham, and Dennis L. Dowden, both of St. Louis, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Apr. 26, 1979, Ser. No. 33,530

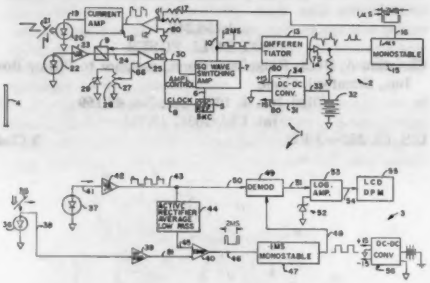
Int. Cl.³ G01N *21/00*

U.S. Cl. 356—73.1 **11 Claims**

1. A device for measuring the attenuation of a fiber optic cable, comprising:

a transmitter means for generating reference signals through a fiber optic cable including means for generating a test signal, means for superimposing a timing signal on said test signal to obtain said referenced signal; and

a receiver including means for receiving said referenced signal, means for recovering the timing signal, means



operatively connected to the timing signal recovery means for providing a demodulating signal for the test signal, means for comparing the demodulated signal to a reference, and means for displaying any difference in said last-mentioned comparision.

4,234,254

UNIT FOR MEASURING PLANENESS

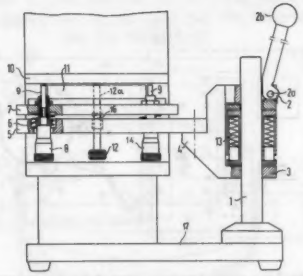
Bodo Dreisbach, Bad Toelz, and Karl Eidling, Egling, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 7, 1979, Ser. No. 18,184

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810512

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—244 **6 Claims**



1. A device for use with an interferometer for measuring the planeness of thin, stiff disks comprising:

a suction plate having suction channels connected to a vacuum source and area thereon for holding items to be measured by means of suction;

a reference plate disposed above said suction plate;

a swivel means for moving said suction plate beneath said reference plate; and

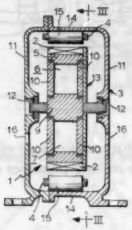
adjustment means for moving said suction plate to a desired angle beneath said reference plate.

4,234,255

COMBINED MOTOR MEANS AND ROTATIONAL CELL

Kozo Ishida; Hiroyuki Amimoto, and Osamu Saitoh, all of Miyanohigashi, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Oct. 12, 1978, Ser. No. 950,610
Claims priority, application Japan, Oct. 15, 1977, 52-123798
Int. Cl.[3] G05D *25/00*
U.S. Cl. 350—274 3 Claims



1. A combined motor rotor and correlative rotational cell, for use in a single sample cell type apparatus for measuring components in a gas, said combined motor rotor and correlative rotational cell comprising:

a rotor having a hollow cylindrical body with a plurality of magnetic poles extending around the periphery thereof, said rotor having at least one diametrically extending partition wall extending across the hollow interior of said body for dividing said body into at least two compartments for containing specified gases therein and the end walls of said body being optically transparent windows;

rotor shaft means mounted on the outside of said end walls of said body;

an outer casing having a peripherally extending wall and opposite end walls, said end walls having bearing means for mounting said rotor shaft means thereon and thereby supporting said rotor within said outer casing, said outer casing further having a plurality of coils mounted around the inside of said peripherally extending wall for interacting with said poles and causing said rotor to rotate and said end walls of said outer casing having aligned apertures for passing light through said end walls of said outer casing and said rotor; and

a light chopper mounted on one side of said rotor, said light chopper being made of ferromagnetic material for increasing the torque being exerted on said rotor.

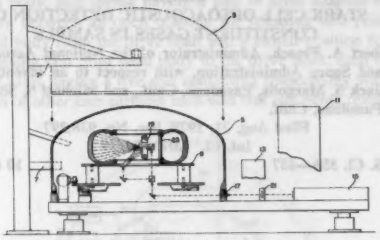
4,234,256

DETERMINING DEPTH LOCATION OF SEPARATIONS WITHIN A TIRE

Robert W. Yeager, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 3, 1978, Ser. No. 892,546
Int. Cl.[3] G01B *9/021*
U.S. Cl. 356—348 4 Claims

3. Method of determining the depth of a separation in a tire which method comprises subjecting the tire to two discrete pressures differing by a predetermined increment of pressure, at least one of said pressures being sub-atmospheric, producing a double exposure holographic film of the surface of the tire making one exposure of the film at each of said two pressures,



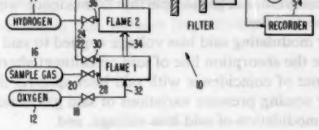
and determining from said film the depth of said separation in the tire with respect to the inner surface of the tire.

4,234,257

FLAME PHOTOMETRIC DETECTOR ADAPTED FOR USE IN HYDROCARBON STREAMS

Harold V. Carter, and Frederick G. Durfee, both of Falls Township, Bucks County, Pa. assignors to Process Analyzers, Inc., Fallsington, Pa.

Filed Jan. 15, 1979, Ser. No. 3,101
Int. Cl.[3] G01J *3/48*
U.S. Cl. 356—417 22 Claims



1. An improved flame photometric detector of the type comprising:

(a) a first burner;

(b) means for supplying to said first burner a sample gas, hydrogen, and oxygen;

(c) a first flame holder extending into said first burner, said first flame holder being adapted to act as an ignition means for said first burner and for locating a first flame therein;

(d) a second burner surrounding said first burner, said second burner including means for combining additional hydrogen gas with the combustion products of said first flame;

(e) a second flame holder extending into said second burner, said second flame holder being adapted to act as an ignition means for said second burner and for locating a second flame therein; and

(f) photodetector means for examining the light emissions in the combustion products of said second flame, said photodetector means being responsive to a given wavelength of light emitted by said second flame, said given wavelength of light being characteristic of the presence of the element being detected;

wherein the improvement comprises a third burner located in the stream of combustion products from said second flame, said third burner comprising:

(a) means for combining additional hydrogen gas with the combustion products of said second flame;

(b) an electrically heated filament which also acts as a catalyst for oxidizing gases adjacent said filament; and

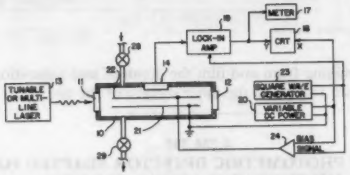
(c) means for supplying a current through said filament.

4,234,258

STARK CELL OPTOACOUSTIC DETECTION OF CONSTITUENT GASES IN SAMPLE

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Jack S. Margolis, Pasadena, Calif., and Michael S. Shumate, Pasadena, Calif.

Filed Aug. 31, 1978, Ser. No. 938,297
Int. Cl.³ G01N *21/39*
U.S. Cl. 356—437 **10 Claims**



4. Apparatus for gas analysis using the Stark effect comprising

means for generating a laser beam having at least one predetermined spectral line frequency,

a gas sample cell in the path of said laser beam, said cell having windows for said beam to pass, and electrically isolated plates parallel to said beam and parallel to each other, one plate on each side of said beam,

means for applying a bias voltage to said plates to create an electric field between said plates which will adjust the absorption line of a predetermined constituent suspected to be present in said gas sample into coincidence with said laser spectral line,

means for modulating said bias voltage applied to said plates to move the absorption line of said constituent alternately in and out of coincidence with said laser spectral line,

means for sensing pressure variations of said gas in said cell during modulation of said bias voltage, and

means for displaying said pressure variations as a function of said bias voltage to determine the presence of said constituent from a peak absorption at the absorption line of said constituent, and to determine the parts per million of said constituent from the amplitude of said peak.

4,234,259

MIXING APPARATUS FOR KNEADING OF PLASTIC SUBSTANCES

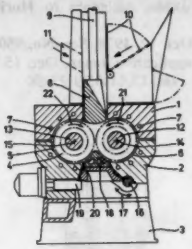
Werner Wiedmann, Stuttgart, and Hanns-Martin Schmid, Kornta, both of Fed. Rep. of Germany, assignors to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Jul. 17, 1979, Ser. No. 58,375
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1978, 2836940
Int. Cl.³ B01F *7/08*; B29B *1/10*
U.S. Cl. 366—81 **8 Claims**

1. A mixing apparatus comprising:

a housing;

a mixing chamber defined within said housing, said mixing chamber including two counter-rotating parallel shafts on which are disposed radially extending vane means, said vane means including at least one principal conveying and mixing vane on each shaft, the upstream end of said principal vane defining a stream-dividing head which terminates at an axial distance from an end face of said mixing chamber, said axial distance thereby defining a frontal passage of said mixing chamber, and wherein the pitch angle (α) of said vane means is maximally 40°, the ratio of the axial projected length (l) of said vane means to the axial length (L) of the mixing chamber is at least 0.5 and the ratio of the average clearance (S) between the ridge of said vane



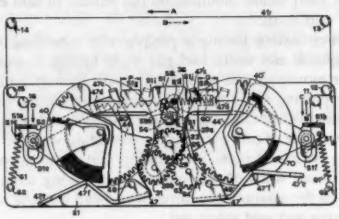
means and the interior walls of said mixing chamber to the diameter (D) of the mixing chamber is at least 0.02.

4,234,260

DEVICE FOR FEEDING INK RIBBON

Masao Kunita, Sayama; Nagao Mizutani, Hachiouji, and Toshio Kurihara, Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1978, Ser. No. 973,622
Claims priority, application Japan, Jan. 24, 1979, 52/56441
Int. Cl.³ B41J *33/40*
U.S. Cl. 400—219.3 **3 Claims**



1. A device for feeding an ink ribbon for use in a printing machine in which said ink ribbon is reciprocally run by rotating reels on which said ink ribbon is wound, said device for feeding said ink ribbon comprising:

a. a main drive member, a drive means coupled to the main drive member for providing driving force thereto;

b. two driven members for rotating said reels on which is wound said ink ribbon;

c. a driving force transmission member which reciprocally moves to selectively transmit the driving force of said main drive member to said two driven members;

d. follower members which move following the winding amount of said ink ribbon while being contacted with pressure onto the outer peripheral surfaces of said ink ribbon wound on each of said reels;

e. a spring for accumulating a force by the movement of said follower members, the accumulated force being used for moving said driving force transmission member; and

f. a movement control member which usually inhibits the movement of said driving force transmission member and which releases the inhibition of movement for said driving force transmission member when an end portion of the ink ribbon is detected.

4,234,261

PRINTER

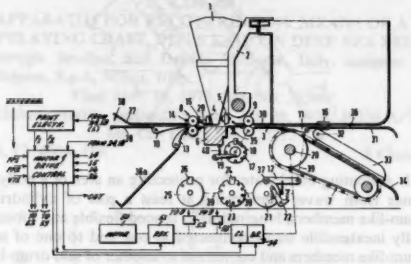
Wolfgang Hendrischk, Neu-Ulm; Gerhard Nolte, Ulm, and Gerhard Schrader, Rodgau, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 892,653

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 2715428; Apr. 4, 1977, 2715429

Int. Cl.[3] B41J *11/70, 11/42*

U.S. Cl. 400—621 21 Claims



1. In a printer for printing individual forms on a web, including a print head and a platen, further including a cutter adjacent to the print head, the improvement

of reversible web advance means disposed upstream from the platen and the print head for moving the web in a particular direction toward and through a space between the platen and the print head and in a direction opposite to said particular direction;

a friction drive disposed downstream from the platen and the print head so that the print head and the platen are located between the friction drive and the advance means;

first control means connected for operating the web advance means (a) for moving the web in said particular direction for the length of a form prior to printing and subsequent to previous printing, and (b) for stepwise retracting the web in the opposite direction during line-by-line printing;

the cutter being operated for cutting a form from the web following printing; and

second control means for the friction drive for advancing the form as cut form in the particular direction, while the web remains stationary.

4,234,262

SINGLE ELEMENT PRINT HEAD

Toshio Nakai; Susumu Kuzuya; Akira Asai; Takayuki Iwase; Hiroshi Onoda, and Kazuo Nakamura, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 3, 1979, Ser. No. 26,676

Claims priority, application Japan, Apr. 28, 1978, 53/58721

Int. Cl.[3] B41J *1/60*

U.S. Cl. 400—175 4 Claims

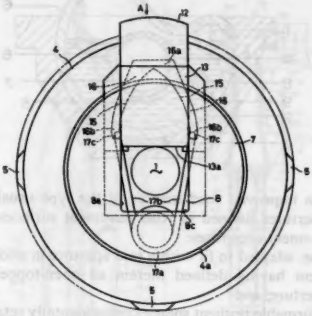
1. In a single print element head releasably attached to a drive shaft, the improvement wherein said print head comprises:

a print head body having a central openind therethrough for receipt of the drive shaft and characters formed on the periphery thereof;

a cap secured on said print head body around one end of said opening;

a manual slide member held by said cap so as to be slidable in a perpendicular direction to the axis of the drive shaft, between a first and a second positions, said manual slide member having a cam means in the bottom portion thereof, said cam means consisting of a pair of cam surfaces which gradually diverge, from the mutually nearest portion towards the mutually farthest portion, each of said cam surfaces having a recess therein adjacent to its said farthest portion; and

a spring disposed in a space formed between said cap and said body, said spring having a pair of arms adapted to move between an open position for releasing said print head body from the drive shaft and a closed position for fastening said print head body to the drive shaft, each of said arms having a free end contacting respectively with each of other cam surfaces each said free end being rested



in a respective one of said recesses when said manual slide member is in said second position, said arms being moved from said open position to said closed position when said manual slide member is moved from said second position to said first position and wherein said spring is formed in a hair pin like shape and consists of a base portion and said pair of arms extending from said base portion, each of said arms being bent at its free end so as to be contacted with each of said cam surfaces respectively.

4,234,263

JOINT UNIT PROVIDING MULTIPLE JOINTS

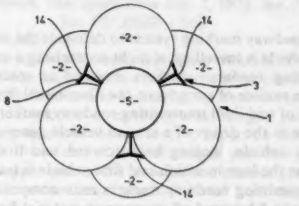
Ward T. Robinson, 68b Creyke Rd., and Richard H. Nokes, 27 Tuirau Pl., both of Christchurch, New Zealand

Filed Jan. 18, 1979, Ser. No. 4,477

Claims priority, application New Zealand, Jan. 30, 1978, 186340; Jul. 11, 1978, 187831

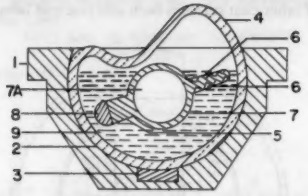
Int. Cl.[3] B25G *3/00;* F16B *1/00*

U.S. Cl. 403—405 14 Claims



1. A joint unit providing six ball-and-socket joints and comprising: six balls arranged as a substantially close-packed octahedral cluster; and a binder rotatably supporting said balls in position and providing a socket for each ball.

4,234,264
MULTI-DIRECTIONAL MARKING DEVICE OF THE TYPE TO BE USED ON PAVEMENT SURFACES
Michael O. Baldi, 120 Sumner St., Newton Centre, Mass. 02159
Filed Jan. 2, 1979, Ser. No. 342
Int. Cl.[3] E01F *9/00*
U.S. Cl. 404—11 4 Claims



1. An improved road marker of the type usually fastened into apertures defined in road pavement surfaces where the improvement comprises:

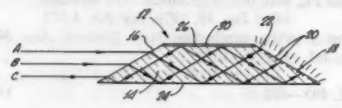
a base, adapted to fit within said aperture in said road pavement having defined therein an open-topped spherical aperture; and

a deformable resilient sphere conincidentally retained in said open topped spherical aperture, having a portion thereof protruding above said base and said road pavement surface; and

wherein said resilient sphere is free and able to universally rotate in said open-topped spherical aperture; and

wherein said sphere is hollow and includes independent means for reflecting light wherein said means used for the purpose of reflecting light entering said sphere, back outside said sphere, is positioned within said sphere and said sphere is light transmittable thereby allowing light to freely enter said sphere through the wall of said sphere and said means for reflecting light has the capacity to be independently displaced when said sphere is deformed and therefore said means for reflecting light is protected from damage.

4,234,265
LIGHT TRANSMITTING ROADWAY MARKER
George A. Otis, 715 E. Los Angeles Dr., Vista, Calif. 92083
Filed Feb. 28, 1977, Ser. No. 772,455
Int. Cl.[3] E01F *9/04*
U.S. Cl. 404—16 3 Claims

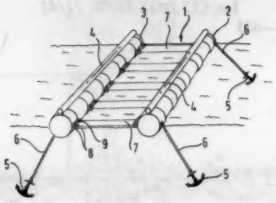


1. A roadway marking system to delineate the lane in which a first vehicle is travelling at night comprising a series of light transmitting roadway markers attached at spaced intervals along the surface of a roadway, the illuminated front face of at least one of said light transmitting roadway markers adapted to be visible to the driver of a second vehicle generally ahead of said first vehicle, looking back toward said first vehicle to determine the lane in which said first vehicle is travelling, said light transmitting roadway markers each comprising:

a. a body fabricated of transparent material having a back window at one end to receive light from the headlights of said first vehicle travelling in a lane of said roadway; and,

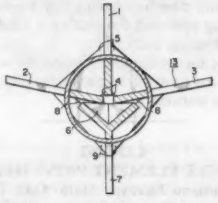
b. a light scattering front face at its other, opposite end illuminated by the light received on said back window and transmitted through said body.

4,234,266
FLOATING BREAKWATER
Attilio Angioletti, Milan, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy
Filed Dec. 5, 1978, Ser. No. 966,561
Claims priority, application Italy, Jan. 13, 1978, 19226 A/78
Int. Cl.[3] E02B *3/06*; B63B *35/34*
U.S. Cl. 405—26 5 Claims



1. A floating breakwater for protecting an area of a body of water from waves comprising at least a pair of cylindrical drum-like members, longitudinally spaced flexible and substantially inextensible strips connected at one end to one of said drum-like members and connected to another of said drum-like members at the other end, closed hollow tubular members of smaller cross section than the cylindrical members fixed to said cylindrical members above the water level and means for anchoring the first and last of said cylindrical members while afloat to the bottom of a body of water.

4,234,267
DRAIN TRAP
Shigeto Kumagai, 7-13, Koyanagi-cho, 3-Chome, Fuchu-shi, Tokyo, Japan
Filed Sep. 15, 1978, Ser. No. 942,850
Claims priority, application Japan, Sep. 22, 1977, 52/114110; Oct. 31, 1977, 52/145020[U]
Int. Cl.[3] E02B *11/00*
U.S. Cl. 405—42 10 Claims



1. A water-conveying structure for use in combination with a soil drainage system, including a water-conveying body comprising;

a plurality of essentially planar water-conveying plates also termed upper plates, each of said plates having a straight edge, said plates being radially arranged and disposed for forming narrow slots between said edges for permitting the passage of water therethrough while retaining solid matter;

a further water-conveying plate, termed lower plate, and having a Y-shaped section, the arms of said Y forming a water passage, said body being orientable in use for receiving in said water passage water flowing downwardly through said slots, each of said plates having a narrow end for insertion into a drain pipe and for joining said body to said drain pipe; said water passage having a downward slope toward said narrow end when said slots are oriented horizontally; each of said narrow ends having an outer edge; and

packing plate means for blocking solid material from entry

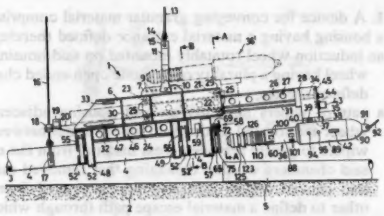
into said drain pipe, said packing plate means having therein radial apertures for receiving said narrow ends of said upper plates and an essentially triangular aperture for receiving said narrow end of said lower plate, and permitting flow of water from said water passage into said drain pipe, the periphery of said packing plate means being such that it can be inserted into said drain pipe for blocking entry of solid matter into said drain pipe.

4,234,268

APPARATUS FOR RECOVERING, BY MEANS OF A PIPELAYING CRAFT, PIPES LAID ON DEEP SEA BEDS

Ambrogio Scodino, San Donato Milanese, Italy, assignor to Saipem, S.p.A, Milan, Italy

Filed Mar. 19, 1979, Ser. No. 21,949
Claims priority, application Italy, Jul. 28, 1978, 26236 A/78
Int. Cl.[3] F16L *1/00, 55/12*
U.S. Cl. 405—158 **5 Claims**



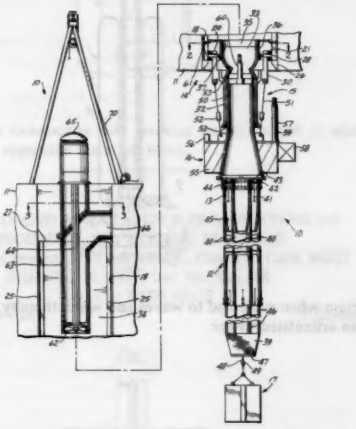
1. An apparatus for recovering, by means of a pipelaying craft, a pipe coated with concrete and laid on deep sea beds, comprising a framework for removably supporting, and inserting into said pipe, a sealing and pulling head traversed axially by a central tube and provided with a transverse bore in proximity to that end thereof to be inserted into the pipe, and provided at its other nose-shaped end with a system for automatically coupling a pulling cable for raising the pipe to be recovered on to the pipelaying craft, said apparatus being guided on to the pipe to be recovered by means of a guide ring releasably mounted to the end of a bracket projecting from one side of said framework, and through which there is inserted a guide cable stretched between the pipelaying craft and said pipe, and being provided at its lower end with two pairs of hydraulically operable jaws for clamping the framework on to the pipe to be recovered, with a cutting device for cutting the possible damaged part of the pipe to be recovered, and with means for perforating the pipe and for inserting a locking pin provided with shoulder teeth into said transverse bore in said sealing and pulling head when this latter has been inserted into the pipe to be recovered, wherein said framework extends longitudinally with a square cross-section, in which a beam is slidably supported axially by means of four pairs of running wheels disposed in opposing pairs, and terminates at one end in the form of a shoulder plate or stop, from which a pivot extends outwards for rotating an upwardly projecting bridge which at its upper end supports, releasably by remote control, said sealing and pulling head disposed longitudinally, said bridge being made to rotate about said rotation pivot by a remote controlled hydraulic motor fixed thereto, on the drive shaft of which there is keyed a gear wheel which engages with a second gear wheel keyed on to said rotation pin, said beam being made to slide longitudinally by a remote controlled double acting hydraulic cylinder disposed longitudinally and supported by said framework, its piston being rigidly connected to said shoulder plate or stop of said beam by means of a rod.

4,234,269

DEPLOYMENT, RELEASE AND RECOVERY OF OCEAN RISER PIPES

Abraham Person, Los Alamitos; Sherman B. Wetmore, Westminster, and James F. McNary, Santa Ana, all of Calif., assignors to Global Marine, Inc., Los Angeles, Calif.

Filed Aug. 21, 1978, Ser. No. 935,672
Int. Cl.[2] F02D *21/00*
U.S. Cl. 405—195 **29 Claims**



1. An elongate pipe assembly adapted to be disposed substantially vertically in an ocean with its end coupled to a structure adjacent the ocean surface for support of the assembly with its lower end located above the ocean floor, the pipe assembly comprising an elongate pipe construction having upper and lower ends, and floatation means connected to the construction at the upper end thereof, the assembly overall having net negative buoyancy with the floatation means having sufficient positive buoyancy to cause the center of buoyancy of the assembly to be located closer to the floatation means than is the center of mass of the assembly so that the assembly, in the event of loss of support thereof, sinks to the ocean floor and assumes a substantially upright attitude with the upper end of the construction located above the ocean floor.

4,234,270

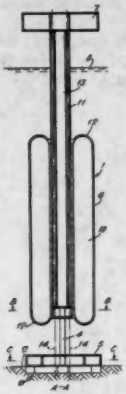
MARINE STRUCTURE

Trygve Gjerde; Kjell Vigander, both of Jar; Dag N. Jenssen, As, and Bjorn Hjertas, Sandefjord, all of Norway, assignors to A/S Hoyer-Ellefsen, Oslo, Norway

Continuation-in-part of Ser. No. 964,964, Nov. 20, 1978, abandoned, which is a continuation of Ser. No. 829,133, Aug. 30, 1977, abandoned. This application Jan. 2, 1979, Ser. No. 597
Int. Cl.[3] E02B *17/02*
U.S. Cl. 405—202 **8 Claims**

1. A marine structure comprising a base which is intended to be founded to the sea bed, at last one elastic prestressed column which is rigidly fixed to and extending up from the base and a buoyant, rigid structure comprising a submerged part and a part projecting up above the sea level to support a deck superstructure, the lower end of the submerged part being rigidly fixed to the upper end of the at least one elastic, prestressed column, the cross sectional area of the at least one elastic, prestressed column being substantially smaller than the cross sectional area of said lower end of the submerged part and the dimensions and elasticity of said column being such as to produce a first natural period of the complete installed structure which is longer than the significant exciting wave periods whereby said column will deflect in a curved manner when the

buoyant rigid structure is subjected to environmental forces and the main structure will oscillate about its vertical equilibrium when subjected to waves and wind, thereby behaving as an articulated tower.



4,234,271

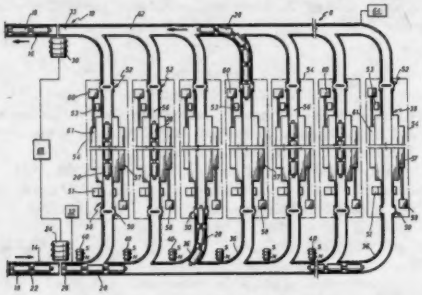
METHOD AND APPARATUS FOR LOADING AND UNLOADING PIPELINE CAPSULES

Alexander I. Kalina, 12439 Millbanks, Houston, Tex. 77031

Continuation-in-part of Ser. No. 925,512, Jul. 17, 1979, abandoned. This application Sep. 4, 1979, Ser. No. 72,318

Int. Cl.³ B65G *51/26*

U.S. Cl. 406—1 **25 Claims**



11. A pipeline capsule transportation system for transporting a continuous link of capsules, the system comprising a first elongated pipeline along which a continuous link of capsules is to be transported, a loading station for loading capsules, and an unloading station for unloading capsules, the loading station comprising a handling zone, displacement means for displacing capsules from the handling zone to the first pipeline, and coupling means for coupling capsules entering the first pipeline to a trailing end of a continuous link of capsules moving along the first pipeline during use.

4,234,272

MATERIAL CONVEYOR

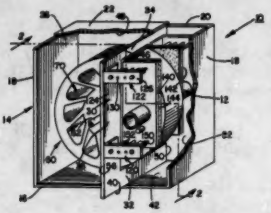
Douglas E. Laseter, 312 Sterling Towers, Jackson, Miss. 39202

Continuation-in-part of Ser. No. 897,338, Apr. 18, 1976, Pat. No. 4,179,232. This application Oct. 6, 1978, Ser. No. 949,137

The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.

Int. Cl.³ B65G *53/46*

U.S. Cl. 406—64 **9 Claims**



1. A device for conveying granular material comprising:

a housing having a material entrance defined therein;

an induction wheel rotatably mounted on said housing, said wheel having a plurality of elongate open-ended chambers defined therein;

a pair of wipers mounted on said housing adjacent said wheel and located so that said wheel passes between said wipers to gently remove excess material from the ends of said chambers without damaging that removed material, said pair of wipers including wipers spaced from each other to define a material escape path through which said gently removed material passes;

sealing means mounted on said housing to sealingly cover said chamber ends, said sealing means including an arcuate housing surrounding said wheel and secured to said housing, a pair of pad members secured to said housing, a pair of pad backing members secured to said arcuate housing and springs biasing said pads against said wheel in a secure manner, said sealing means being separate from and spaced apart from said wipers to be located so that a chamber on said induction wheel passes between said pair of wipers prior to passing said sealing means, said wipers removing excess material from adjacent the ends of a chamber before such chamber is sealed by said sealing means so that material does not interfere with any seal formed between said sealing means and said chamber ends such that said chambers are securely closed to minimize loss of any gas introduced into said chambers for moving material out of said chambers;

gas introducing means connected to said sealing means to introduce gas from a source into a chamber; and

material transport means connected to said sealing means to receive gas and material from said chambers for transporting said material away from said induction wheel.

4,234,273

FLUIDIZABLE MATERIAL HANDLING APPARATUS

Avrom R. Handleman, and Charles S. Alack, both of P.O. Box 13151, St. Louis, Mo. 63119

Division of Ser. No. 801,865, May 31, 1977, Pat. No. 4,149,755. This application Mar. 1, 1979, Ser. No. 16,517

Int. Cl.² B65G *53/36*

U.S. Cl. 406—90 **14 Claims**

1. A pallet for supporting a load of granular, particulate, powdered or other fluidizable material and for fluidizing the load for unloading it from the pallet, said pallet comprising:

a plurality of legs engageable with the ground for supporting the pallet and the load, said legs being spaced for accommodating the tines of a forklift vehicle to facilitate forklift transport of the pallet and said load;

an upwardly facing deck for supporting said load, said deck sloping downwardly toward one side of the pallet;

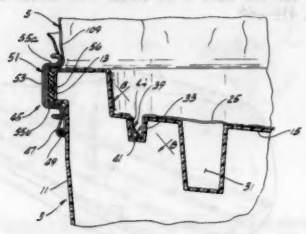
a peripheral wall extending around the pallet joining the said upper deck and said legs;

a porous diaphragm overlying said deck and defining a plenum between said diaphragm and said deck;

an inlet adapted for the introduction of air under pressure into said plenum for fluidizing the load bearing on said porous diaphragm; and

an outlet extending through said peripheral wall for communication from the space above said porous diaphragm to the exterior of the pallet, said outlet having an inner end disposed at said one side of said pallet adjacent an edge of said deck and being generally flush with said deck, said outlet angling downwardly from its innner end whereby said fluidized load flows down said inclined deck toward the inner end of said outlet and thence down said outlet;

and further comprising means for sealably securing a bag of limp synthetic resin film, coated fabric, or the like to said pallet and for preventing air pressure from within said bag present during fluidization of said load from pulling said bag from said pallet, said peripheral wall having an outwardly projecting flange therearound, said bag having a hem on its bottom end and a limp cord within said hem, said bag being adapted to fit over the outside of said flange with said cord disposed below said flange, said securing means comprising a hoop clamp extending around said pallet and fitting over said flange on the outside of said bag, said hoop clamp being channel shaped in cross section and having a generally vertical web and radially inwardly projecting upper and lower flanges, the lower flange of the hoop clamp extending beneath the flange on the pallet, the upper flange of the hoop clamp extending over the flange on the pallet for preventing the weight of the fluidizable material from pushing the hoop clamp down past the flange of the pallet, said securing means further comprising means for circumferentially and adjustably tightening said hoop clamp on said bag and on said flange on the pallet for clamping said bag to said pallet in sealing engagement whereby upon pressurization of said bag and upon said bag being pulled upwardly relative to the pallet, said cord is confined below the lower flange of the clamp and prevents the bag from being pulled off the pallet.



4,234,274

FILTER DEVICE FOR FIBROUS MATERIALS

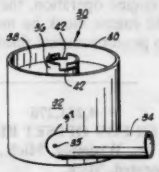
Tom C. Hoshall, 4005 N. Pennsylvania, Oklahoma City, Okla. 73112

Filed May 24, 1979, Ser. No. 42,000
Int. Cl.³ B65G *53/28*
U.S. Cl. 406—93 **7 Claims**

1. A fibrous materials filter device for use in combination with a power driven centrifugal blower apparatus of the type having an axial materials input and tangential materials output, comprising:

housing means having top, bottom and sides and forming an enclosure, and including an input opening in generally tangential direction to said enclosure as formed at a side bottom location, and an output opening in axial direction to said enclosure as formed centrally through said top;

an orifice formed in said input opening adjacent its tangential juncture to said enclosure; and



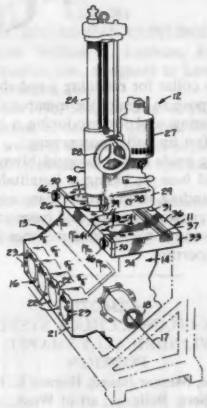
means for connecting said housing means output to said blower apparatus materials input.

4,234,275

METHOD AND APPARATUS FOR MOUNTING AN ENGINE BLOCK BORING MACHINE

Michael H. Clement, 4797 Myrtle Dr., Concord, Calif. 94521

Filed Jul. 26, 1978, Ser. No. 928,268
Int. Cl.³ B23B *41//12*
U.S. Cl. 408—19 **2 Claims**



1. A boring fixture for positioning a boring machine in place upon an engine block having a main bearing axis and a plurality of cylindrical bores arranged perpendicular to the main bearing axis and intersecting a generally flat deck of the block, comprising a base plate adapted to mount upon the deck of the block, said base plate having openings formed in alignment with the cylinder bores and means for securing the boring machine in place upon said base plate in alignment with the cylindrical bores, said means for securing the boring machine comprising a T-shaped slot formed in the base plate for receiving a T-shaped bar on the boring machine and clamping means for fixing the position of the boring machine upon the base plate, adjustable means arranged for interaction between said base plate and the deck of the engine block in order to selectively adjust the position of said base plate upon the deck and thereby place said base plate in precise parallel alignment with the main bearing axis, said adjustable means comprising a slidable wedge-shaped element arranged in a wedge-shaped cavity formed in each end of said base plate with means for adjusting said wedge-shaped elements between said wedge-shaped cavities and a surface portion of the engine block to permit alignment of said base plate with respect to the main bearing axis to perform a boring operation, and means for

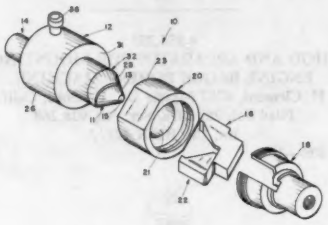
selectively securing said base plate upon the deck of the engine block, said means for securing said base plate upon the deck of the engine block comprising bolts for engaging threaded openings in the block in order to produce distortion of the block about the bores similar to distortion conditions experienced in the block during engine operation, the base plate also being engagable with the engine block by means of said distortion producing bolts to permit accurate finishing of the cylindrical bores.

4,234,276

DRESSER FOR OFFSET ELECTRODE

George D. Meier, Jr., Wyoming, Mich., assignor to Electrode Dressers Incorporated, Mich.

Filed Apr. 2, 1979, Ser. No. 25,895
Int. Cl.³ B23B *39/00, 41/00, 51/00*
U.S. Cl. 408—104 **17 Claims**



1. An offset tip collar for retaining a rod-shaped member in a manner as to expose an area of the member tip which is to be dressed by a dressing tool for producing a member with an offset tip, said offset tip collar comprising:

a base including guide means for guidably receiving a dressing tool, said base including a longitudinally extending aperture extending through said base and radially offset from the longitudinal axis of said base; and

means for securing a rod-shaped member in said base and within said aperture.

4,234,277

MOTOR QUICK-CHANGE CHUCK SYSTEM FOR TOOL HAVING CYLINDRICALLY SHAPED ADAPTER PORTION

Richard L. Benson, Mercer Island; Horace E. Hill, Renton, and Mark S. Soderberg, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 932,593, Aug. 8, 1978, which is a continuation of Ser. No. 799,406, May 23, 1977. This application May 19, 1979, Ser. No. 21,532
Int. Cl.³ B23B *51/00*
U.S. Cl. 408—226 **1 Claim**

1. A tool for use in a quick change tool-holding chuck having locking means including a plurality of spherically shaped balls for securing the tool,

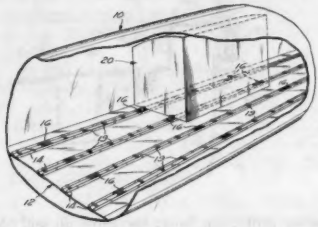
comprising an elongated cylindrically shaped body member, said tool having a working surface at a first end thereof and an adapter portion body member, said adapter portion having a beveled end surface (**58**) facing said working surface at said first end of said elongated cylindrically shaped body member, said adapter portion further including a circumferential recess around the outer surface of said adapter portion, said adapter portion having a plurality of spherically shaped dimples equiangularly disposed about the central axis of said tool in said circumferentially recessed surface of said adapter portion, said adapter portion having a further beveled end surface (**303**) at said other end of said elongated cylindrically shaped body member and, said beveled end surface (**58**) having a flat angle relative to said further beveled end surface (**303**).

4,234,278

LOCKING DEVICES FOR CARGO AND THE LIKE

Ray E. Harshman, Anaheim, and Archie C. Landry, Canoga Park, both of Calif., assignors to Electro-Pneumatic International GmbH, Hansham, Fed. Rep. of Germany

Filed Oct. 31, 1978, Ser. No. 956,373
Int. Cl.³ B60P *7/08;* **B64D** *9/00;* **B61D** *45/00*
U.S. Cl. 410—69 **9 Claims**



1. In a cargo locking device having a pair of spaced supports, first and second locking pawls each pivotally mounted between said supports for movement between a generally flat position and a generally upright position with said first and second locking pawls carrying locking dogs extending in opposed directions when said first and second locking pawls are in their said generally upright position and means for locking the movement of said first and second locking pawls in said generally upright position, the improvement which comprises:

spring means bearing only upon said second locking pawl biasing said second locking pawl towards a generally upright position; and

at least one restraining member carried by said first locking pawl and engaging said second locking pawl when in said generally flat position to overcome the force of said spring means and thereby retain both said locking pawls in said generally flat position between said supports, said restraining member of said first locking pawl disengaging from said second locking pawl as said first locking pawl is pivotally moved to said generally upright position whereby said spring biased locking pawl also moves pivotally upward to said generally upright position under the urging of said spring means.

4,234,279

AUTOMATIC APPARATUS FOR DISCHARGING LOOSE PRODUCTS IN BINS

Nevio Lotti, Cesena, Italy, assignor to Sorma S.n.c. di Pieri-Lotti & C., Cesena, Italy

Filed Dec. 13, 1978, Ser. No. 968,984
Claims priority, application Italy, Jun. 29, 1978, 3482 A/78
Int. Cl.³ B65G *60/00, 65/34*
U.S. Cl. 414—33 **17 Claims**

1. Automatic apparatus for discharging loose products con-

tained in bins, particularly fruit, vegetables and the like, comprising on a fixed frame:

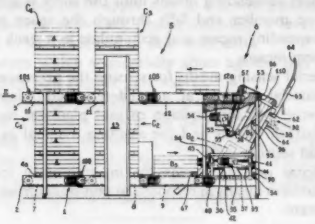
a lower platform for feeding in full bins and an upper platform for discharging empty bins;

an oscillating frame for receiving the full bins and positioned in the region of said lower platform and able to be tipped alternately from a virtually horizontal non-operative position in alignment with said lower platform, to a position in which the discharge of the products contained in the bins is prepared, said latter position requiring a rotation of more than 90° with respect to the non-operative position;

means for causing the oscillating frame to be tipped in one direction or the other;

means mounted on said oscillating frame for restraining the products inside the bins at the time said frame is in an inclined position;

first transfer means mounted on said oscillating frame for lifting the full bins while said frame is in the inclined position;



a fixed discharge aperture placed a certain height above said oscillating frame, in alignment with an open side of the bins when they are in the inclined position in which the products are discharged;

a second transfer means mounted on said fixed frame, above said oscillating frame, for lifting the bins further up and tightly against said discharge aperture, after the lifting operation performed by said first transfer means;

locator means placed in the region of said second transfer means and said upper discharge platform, for overturning the empty bins from the inclined position to the virtually horizontal position, above said upper platform, in which the orientation of the empty bins corresponds to that of the full bins being fed in;

and means for detecting various positions adopted gradually by the bins, so as to coordinate the operation of said transfer means and said means for tipping the oscillating frame.

4,234,280

PALLETIZER

Bernard P. Donnelly, and Roland W. Van Slooten, both of Holland, Mich., assignors to The Lithibar Company, Holland, Mich.

Filed Jun. 8, 1978, Ser. No. 913,565
Int. Cl.³ B65G *57/30*
U.S. Cl. 414—35 **18 Claims**

1. An apparatus for stacking a plurality of layers of articles on top of each other, comprising:

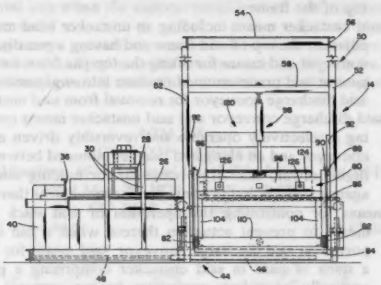
a fixed frame supporting a plurality of spaced, parallel rollers;

a carriage support frame supported by said fixed frame for vertical movement relative thereto;

a pair of opposed carriages slidably supported on said carriage support frame for movement towards and away from each other and from said rollers along the axis of rotation of said rollers, said carriges each supporting a plurality of spaced, parallel tines, said tines lying in the same horizontal plane and extending between said rollers as said carriages move towards said rollers and towards each other;

clamp means mounted on said carriage support frame for clamping a layer of articles placed on said rollers; and

means for simultaneously shifting said carriages towards each other and said rollers to position said tines under a



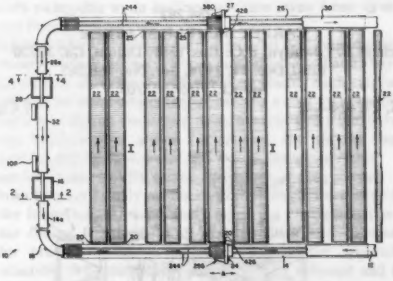
layer of articles and for lifting said carriage support frame to bring said tines into engagement with said articles above said rollers to lift said articles vertically and for actuating said clamp means.

4,234,281

AUTOMATIC BREAD PAN CONTROL SYSTEM

William E. Lanham; William E. Lanham, Jr., and Gene C. Miller, all of Decatur, Ga., assignors to Lanham Machinery Company, Inc., Atlanta, Ga.

Continuation of Ser. No. 584,026, Jun. 4, 1974, abandoned, which is a continuation of Ser. No. 325,108, Jan. 17, 1973, Pat. No. 3,937,335, which is a continuation-in-part of Ser. No. 243,074, Apr. 11, 1972, abandoned. This application Sep. 8, 1977, Ser. No. 831,482
The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.
Int. Cl.² B65G *57/04, 60/00*
U.S. Cl. 414—37 **5 Claims**



1. A pan handling apparatus comprising an infeed conveyor for supplying individual pans to the apparatus, a storage station at which stacks of pans may be stored, pan stacker means for receiving said individual pans from the infeed conveyor and placing said pans in a stack, stack conveyor means for transporting the formed stack from said stacker means to said storage station, means for selectively removing stacks of pans from said storage station and supplying the stacks to an unstacking station, pan unstacker means at said unstacking station for receiving said stacks of pans and sequentially removing individual pans therefrom, and feed conveyor means for transporting individual pans away from said unstacker for use;

said means for supplying pan stacks to said unstacking station including a stack transport conveyor for supplying stacks from said storage station to the lower end portion of said unstacker means, and said unstacker means compris-

ing a frame, a selectively operable endless conveyor mounted at the bottom of said frame for receiving a stack of pans from said transport conveyor and selectively operable means for lifting a stack of pans on said endless conveyor to a predetermined position with respect to the top of the frame;

said unstacker means including an unstacker head mounted adjacent the top of said frame and having a pan discharge conveyor and means for lifting the top pan from a stack of pans at said predetermined position into engagement with said discharge conveyor for removal from said unstacker;

said discharge conveyor and said unstacker means comprising a selectively operable and reversibly driven endless conveyor and an elongated magnet mounted between the flights of said discharge conveyor for holding said pans against said discharge conveyor for movement therewith;

means for controlling the operation of said stack lifting means to prevent actuation thereof when a pan is supported on said discharge conveyor; said means for lifting a stack of pans in said unstacker comprising a pair of vertically extending conveyors having opposed stack support lugs mounted thereon and means for varying the spacing between said vertically extending conveyors whereby said unstacker means is adapted to accommodate bread pans of different widths; and means for moving said vertically extending conveyors in a predetermined direction to raise said stack of pans thereon a predetermined distance each time a pan is removed from the top of the stack by said unstacker head;

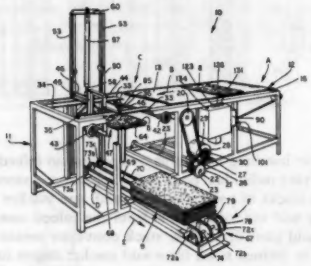
said means in said unstacker head for lifting the topmost pan from said stack of pans comprising a pair of sprockets rotatably mounted in said unstacker head, along parallel horizontal axes, an endless chain trained about said sprockets and means for reversibly moving said chain, said sprockets each having a crank arm secured thereto for rotation therewith; a reciprocal frame member having a plurality of slots formed therein and receiving the free ends of said crank arms, thereby to be reciprocated in a vertical direction upon rotation of said crank arms, and at least one elongated magnet secured to said reciprocal frame for vertical movement therewith.

4,234,282

CARPET SAMPLE STACKER

Michael A. Lewallyn, P.O. Box 1361, Dalton, Ga. 30720

Filed Dec. 11, 1978, Ser. No. 968,267
Int. Cl.³ B65G *57/03*
U.S. Cl. 414—45 **7 Claims**



1. An apparatus for automatically stacking carpet samples and like sheets of material, comprising:

a first surface conveyor means for moving the sheets of material along a first horizontal path from a first end to a second end of said first surface conveyor means;

a second surface conveyor means positioned at the second end of said first surface conveyor means and below said first surface conveyor means and extending at a right angle with respect to the first horizontal path of said first surface conveyor means for moving the sheets of material along a second horizontal path;

a platform means for moving the sheets of material vertically from the second end of said first surface conveyor means to said second surface conveyor means, said platform means being movable between a top position adjacent the second end of said first surface conveyor means and a bottom position adjacent said second surface conveyor means;

a pair of spaced apart horizontally oriented sheet suspending means positioned at the end of the first horizontal path and extending from and beyond the second end of said first surface conveyor means and defining a space therebetween vertically above said platform means;

a stop member positioned in the space between said sheet suspending means and spaced from the second end of said first surface conveyor means whereby sheets are pushed by the first surface conveyor means out onto the spaced sheet suspending means until the sheet is stopped by the stop member and falls through the space between said suspending means and accumulate in a stack on said platform means;

material sensing means for sensing the presence of sheets of material stacked at a predetermined minimum height above said top position of said platform means on said platform means and for emitting a signal in response to said sensing; and

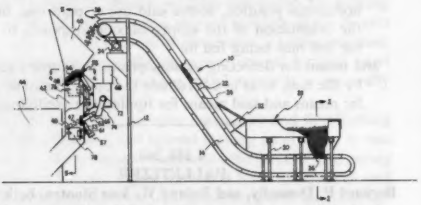
platform moving means for intermittantly lowering said platform means in response to said signal from said sensing means.

4,234,283

SCRAP METAL FED SYSTEM FOR A CLOSED ROTARY KILN OR HEATING OVEN

Noel H. Twyman, Newport Beach, and Robert F. Jenkins, Laguna Niguel, both of Calif., assignors to Automated Production Systems Corporation, Tustin, Calif.

Continuation-in-part of Ser. No. 771,967, Feb. 25, 1977, abandoned. This application Apr. 18, 1978, Ser. No. 897,381
Int. Cl.³ B66C *17/08*
U.S. Cl. 414—171 **4 Claims**



1. A scrap metal feed system which comprises:

an endless variable speed conveying means,

said conveying means including a surface for supporting materials,

said surface having flights extending outwardly from said surface at periodic intervals along the length of said surface,

a first hopper means,

a second hopper means,

said conveying means extending horizontally beneath the bottom of said first hopper means and then upwardly at an angle to the horizontal greater than about 50 degrees and less than about 80 degrees and terminating over the top of said second hopper means,

said conveyor being exposed to the interior of said first hopper as it extends upwardly to said angle to the horizontal so that material can move back along said conveyor means into said first hopper as said conveyor is operated,

said conveyor being positioned near the top opening of said second hopper means so that the material conveyed by said conveying means is deposited into said second hopper means,

chute means,

said chute means having an upper end and a lower end, said upper end integrally connected with the bottom of said second hopper means, the lower end opening into a kiln,

said chute means having two flapper gate means interposed between said upper end and said lower end, said flapper gate means having an open and a closed position,

coordinated activating means opening and closing said flapper gate means such that when one of said flapper gates is in an open position, the other is not,

each of said flapper gate valves including a shaft pivotally mounted in said chute and a plate attached to said shaft along one side of said plate such that said plate opens and closes in said chute as said shaft pivots, and a counterweight means attached to one end of said shaft for reversibly maintaining said flapper gate in a closed position,

said coordinating activating means including a lever arm attached to the other end of said shaft and

abutting means which sequentially abuts against said lever arm opening said flapper gate valves,

motor means activating said abutting means,

said lever arm includes a roller on the end thereof,

said abutting means includes a striking arm, said motor means connected to said striking arm such that said striking arm engages said roller on said lever arm displacing said lever arm as said striking arm rotates.

4,234,284

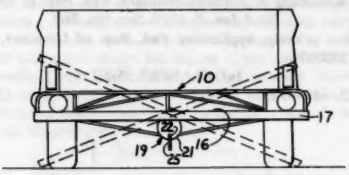
UTILITY PLATFORM

Joe Hauff, 65 Bonanza Dr., Pasco, Wash. 99301

Filed Apr. 24, 1978, Ser. No. 899,537

Int. Cl.[2] B60R *9/00*; B60P *1/24*

U.S. Cl. 414—462 **4 Claims**



1. A utility platform mountable to a vehicle, comprising:

a central support beam adapted to be mounted to the vehicle in a stationary and horizontal position thereon;

a support panel;

bearing means mounting the support panel to the central support beam for free pivotal movement of the support panel about a horizontal axis between a loading position wherein the support panel is tipped to one side of the horizontal axis and a carrying position wherein the support panel is horizontal;

the support beam and bearing means being centered across the support panel so that the support panel is balanced thereon when at its carrying position; and

manually relesable detent means interconnecting the support beam and support panel for allowing pivotal movement of the support panel about said horizontal axis to its loading position and automatically operable for locking the support panel in its horizontal carrying position as the support panel is pivoted about said horizontal axis to a horizontal position;

the detent means comprising:

a locking lever mounted to the support panel for pivotal movement therewith about the horizontal axis;

a plate mounted to the central support beam having an arcuate surface formed about the horizontal axis for slidably engaging the locking lever;

an indentation positioned along the arcuate surface of the plate to receive and releasably lock the locking lever and support panel against pivotal movement about the horizontal axis when the support panel is at its carrying position; and

biasing means operatively connected between the support panel and locking lever for continuously urging the locking lever inwardly toward the arcuate surface of the plate.

4,234,285

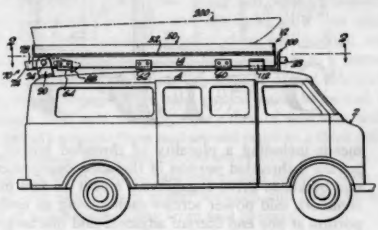
ROOF TOP CARRIER

Evidio Martinez, 6875 Tamiami Canal Rd., Miami, Fla. 33126

Filed May 21, 1979, Ser. No. 40,884

Int. Cl.[3] B60P *3/10*; B60R *9/08*

U.S. Cl. 414—462 **11 Claims**



1. An apparatus for carrying an article on the roof top of a motor conveyance and for conveniently loading and unloading the article, comprising:

a main frame including a pair of parallel side runs spaced a predetermined distance from each other, the runs including front and rear ends, the runs spanned by at least one cross member located a predetermined distance from the rear ends, and a hinge means fixedly connected to the top of the motor conveyance adjacent the rear ends, the main frame rotatably connected to the hinge means at the rear ends swingable to an inclined position away from its normal horizontal position,

a sliding frame including a pair of parallel side runs spaced a predetermined distance from each other, sized and shaped for sliding movement with the main frame, each run having a front end comprising a post and a rear end comprising a rear sliding frame end zone, the rear end zone including spring-loaded means for locking the sliding frame against sliding movement relative to the main frame,

a carrier means fixedly connected to the sliding frame,

a front bracket fixedly mounted to the conveyance opposite the hinge means, sized and shaped for engagement with the sliding frame posts, comprising front locking means for preventing rotational movement of the apparatus, whereby the spring-loaded lock may be released and the sliding frame moved relative to the main frame and away from the front bracket, thereby the apparatus may be swung about the hinge and the sliding frame may slide relative to the main frame to an inclined and extended position such that the rear end zone is proximate and adjacent a loading and unloading point.

4,234,286

VEHICLE BODY

Miles J. Hamilton, Laguna Beach, Calif., assignor to DEC International, Inc., Madison, Wis.

Filed Aug. 30, 1978, Ser. No. 938,213

Int. Cl.[3] B01F *7/08*

U.S. Cl. 414—512 **21 Claims**

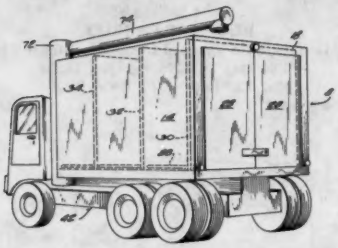
1. A vehicle body comprising:

an outer shell including side walls, end walls and a floor;

a discharge means for discharging material from inside said outer shell to the exterior thereof, said discharge means including a discharge recess located inside said outer shell;

a movable bulkhead means mounted in said shell, said movable bulkhead means including a plurality of vertically positioned, spaced apart bulkhead members, each of said bulkhead members having a bulkhead drive engagement means thereon;

a bulkhead drive means for driving said bulkhead members toward and away from said discharge recess, said drive



means including a plurality of threaded power screws having a threaded portion in threaded engagement with said bulkhead drive engagement means on said bulkhead members, said power screws each having an unthreaded portion at one end thereof adjacent said discharge recess so that as each bulkhead member slides over said discharge recess it will become disengaged from the threaded portions of said power screws, said drive means further including a motor drive unit for driving said power screws in synchronization.

4,234,287

LOAD HANDLING RAILROAD VEHICLE

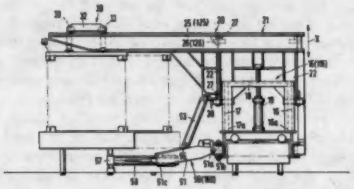
Harry Lässig, and Anton Grosshauser, both of Hamburg-Schenefeld, Fed. Rep. of Germany, assignors to Fördertechnische Forschungsgesellschaft mbH, Hamburg-Schenefeld, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,843

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834163

Int. Cl.³ B60P *1/54*; B66C *7/10*

U.S. Cl. 414—542 **3 Claims**



1. A railroad vehicle for transferring containers and the like onto sidings positioned laterally of the vehicle, particularly below the overhead lines for electrically operated locomotives and units, characterized in that the combination of the following features is provided:

(a) a railroad vehicle platform capable of being moved along railroad tracks, a transfer mechanism supported on said vehicle platform and including two spaced vertically disposed, gantry-shaped supporting frames extending transversely of the direction of movement of said vehicle platform along railroad tracks, a platform trackway supported on and extending in the direction of each of said supporting frames, a crane bridge supported on and extending between said platform trackways with a loading frame movably mounted on said crane bridge.

(b) a jib supported on at least one side of each of said supporting frames adjacent said trackway thereon, each said jib being swingable about a vertical axis between a swung-in position extending in the direction of movement of said vehicle platform along railroad tracks and a swung-out position extending laterally outwardly from said vehicle platform and transversely of the direction of movement of said vehicle platform along railroad tracks, each said jib having a jib trackway which aligns with and connects to one of said platform trackways in the swung-out position for laterally moving a container,

(c) means associated with said supporting frames so that said jib trackways together with said platform trackways in the swung-in position of said jibs can be raised and lowered,

(d) movable base support devices on said vehicle platform which can be swung in and out with said jibs,

(e) each said base support device includes a horizontally directed support arm with a support head at an end thereof which can be placed on a siding or subsidiary track,

(f) each base support device comprises a swivel arm articulated to said vehicle platform in the vicinity of each said supporting frame and is laterally pivotable with said pivotable jib, a hydraulic cylinder mounted on one end of said swivel arm, each said pivotable jib having a lower swivel hinge, the other end of said hydraulic cylinder attached to said lower swivel hinge, and the end of said swivel arm spaced from said vehicle platform is articulated to said support arm with said support head.

4,234,288

APPARATUS FOR TRANSPORTING ELONGATED CYLINDRICAL WORKPIECES

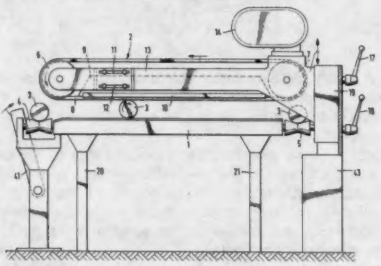
Heinz Hartkopf, Solingen, Fed. Rep. of Germany, assignor to Th. Kieserling & Albrecht, Solingen, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 569

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1978, 2800694

Int. Cl.³ B65G *35/02*

U.S. Cl. 414—745 **13 Claims**

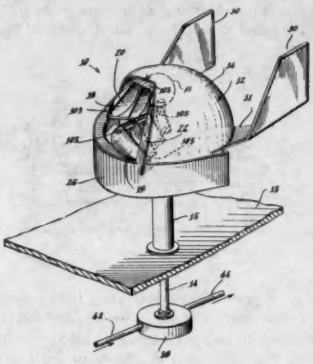


1. Apparatus for transporting elongated generally cylindrical workpieces comprising: a workpiece supporting surface along which elongated generally cylindrical workpieces are rollable, an elongated flexible belt having an elongated lower belt run spaced above said supporting surface and extending therealong substantially parallel thereto, said belt being positioned adjacent one end of said supporting surface and having a relatively narrow width for engaging a workpiece over a short portion of its length adjacent one end thereof, and belt drive means for driving said belt, whereby workpieces gripped between said supporting surface and said lower belt run are rolled along said supporting surface by action of said belt.

4,234,289
FLUID TURBINE

Barry A. Lebost, 1116 Warburton Ave., #1K, Yonkers, N.Y. 10701

Filed Sep. 5, 1978, Ser. No. 939,264
Int. Cl.[3] F03D 1/04
U.S. Cl. 415—2 R 16 Claims



1. A fluid turbine, comprising:

a plurality of rotor blades mounted on a shaft for rotation in a reference plane about the longitudinal axis of said shaft when exposed to a source of flowing fluid.

a housing enclosing said plurality of rotor blades therein and having interior sidewalls spaced above said rotor blades and inclined with respect to said reference plane for creating a fluid swirl area in upper regions of said housing,

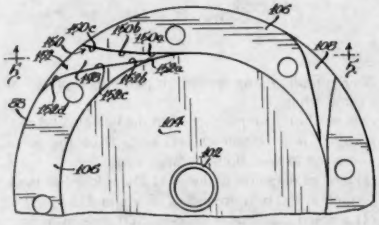
said housing including a fluid entrance passage therein lying within said reference plane in alignment with said plurality of rotor blades, said housing further including a fluid exit passage therein spaced from said swirl area and beneath said plurality of rotor blades, said fluid exit passage extending essentially coextensive with the area swept by said rotor blades upon rotation of the latter,

each of said rotor blades having an upper and lower edge extending from said shaft radially outward from said longitudinal axis, the upper edge of each of said blades leading the lower edge thereof in the direction of rotation of said blades.

4,234,290
TURBINE PUMP

James L. Lobach, Broomfield; David A. J. Outteridge, Denver, and Gary D. Colwell, Boulder, all of Colo., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Filed Nov. 30, 1978, Ser. No. 965,173
Int. Cl.[3] F04D 27/00, 29/44
U.S. Cl. 415—145 15 Claims

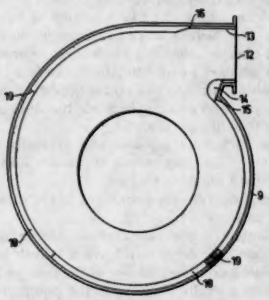


2. A pump for delivering coating material under pressure to coating equipment at one or more coating stations, comprising a housing having a chamber therein, an inlet to said chamber for connection with a supply of coating material, and outlets from said chamber for connection with the coating equipment; an impeller within said chamber, said impeller having a plurality of blades and being rotatable to move edges of said blades past said outlets to pump coating material from said inlet through said outlets, said outlets having fluid flow areas which increase with increasing distance from said chamber, whereby with a constant speed of rotation of said impeller coating material is pumped from said outlets to the coating equipment at substantially a constant pressure despite variations in the flow rates thereof; and bypass valve means for bypassing a selected portion of the coating material away from the edges of said impeller blades and around said outlets to control the pressure of the coating material delivered to the coating equipment, each said outlet having a top wall, a bottom wall and a pair of side walls, said top and bottom walls being generally parallel and said side walls being generally straight and parallel from said chamber to a first point along said passage, said side walls being generally straight and diverging at a first angle from said first point to a second point along said passage, said side walls being generally straight and diverging at a second and greater angle from said second point, one of said side walls being generally straight from said second point to an end of said passage from said chamber, the other of said side walls being generally straight from said second point to a third point along said passage and being curved away from said one side wall from said third point to said end of said passage, wherein neither of said side walls is planar between said chamber and said end of said passage away from said passage.

4,234,291
WEAR LINING

George P. Hurst, Jackson, Calif., and Assar N. Svensson, Ersmark, Sweden, assignors to Skega Aktiebolag, Ersmark, Sweden

Filed Jun. 14, 1979, Ser. No. 48,596
Claims priority, application Sweden, Jun. 16, 1978, 7806952
Int. Cl.[3] F04D 7/02, 29/02
U.S. Cl. 415—174 12 Claims



1. In a curved wear lining for a curved surface facing the center of curvature of the type including a layer of wear rubber rigidly combined with a support plate and with a wearing surface facing said center of curvature and means included in the layer of wear rubber and increasing the wear resistance of the wear lining, the improvement wherein said means comprise metal pins arranged within the layer of wear rubber in one or more reciprocally separated layers and spaced from each other, which pins are oriented in radial planes extending from the center of curvature and at least across the wear surface, said layer of rubber being in compression with the compression increasing from the support surface towards the wear surface as a result of bending of the wear lining from a substantially plane state to the intended curved shape.

4,234,292

FUEL INJECTION PUMP, ESPECIALLY FOR INTERNAL COMBUSTION ENGINES

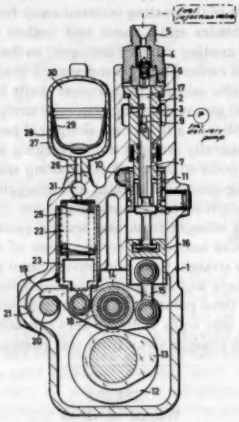
Josef Berg, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,578

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2723969

Int. Cl.[3] F04D *49/02;* F02M *59/10*

U.S. Cl. 417—214 13 Claims



1. A fuel injection pump, especially for an internal combustion engine having a cam shaft, which includes in combination:

a pump housing having a pump chamber therewith,

a cylinder arranged in said pump housing and provided with control passage means for controlling the supply of fuel to said cylinder,

a pump piston axially displaceable in said cylinder and turnable for controlling the fuel quantity to be injected, said pump piston having its circumferential surface provided with an oblique control groove for cooperation with said control passage, a cam rotatable by the cam shaft, a roller engageable with the cam, said roller being unaligned with the pump piston and displaceable by said cam relative to the axis of said cam shaft,

a two arm rocker having one arm pivotally connected to said pump piston and having said roller mounted thereon intermediate the ends thereof,

spring means operatively connected to the other arm of said rocker, and

a stop mounted on said housing, said spring means continuously urging the other arm toward said stop whereby the pump piston continues to rise as the cam on the cam shaft rises so long as the pressure in the pump chamber is less than the pressure exerted by said spring means and whereby the pump piston does not rise when the pressure in the pump chamber exceeds the pressure exerted by the spring in which case the rocker rotates about the cam compressing the spring means.

4,234,293

AXIAL BALANCING SYSTEM FOR MOTOR DRIVEN PUMPS

John R. Lightle, Cypress, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 27, 1979, Ser. No. 24,358

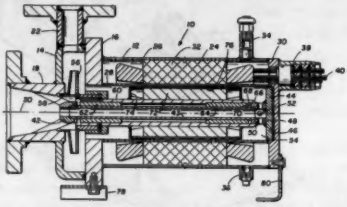
Int. Cl.[3] F04B *17/00, 35/04*

U.S. Cl. 417—365 3 Claims

1. An improvement to an axial balancing system for a motor driven centrifugal pump including a pump and motor housing, a hollow mandrel having one end mounted in the pump housing, a hollow rotor shaft rotatable and axially movable on the mandrel, a bearing located near each end of the mandrel between the shaft and mandrel, said improvement comprising:

a support plate located in the motor housing;

a hollow lug projecting from said plate toward said mandrel, said lug having an outer diameter sized to movably receive the rotor shaft and an interior sized to fixedly receive the other end of the mandrel, and said lug having a



plurality of ports therein providing fluid communication between the interior of the motor housing and the interior of the mandrel, said ports being located in positions to be covered and uncovered by the rotor shaft during axial movement thereof as axial thrust is generated by the pumping of fluid by the motor pump; and,

said lug having an annular end face engageable with one of the bearings to limit the axial movement of the shaft toward said support plate.

4,234,294

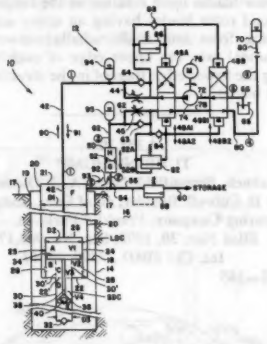
DEEP WELL HYDRAULIC PUMP SYSTEM USING HIGH PRESSURE ACCUMULATOR

James B. Jensen, Rte. 2, Coffeyville, Kans. 67337

Filed Feb. 12, 1979, Ser. No. 11,400

Int. Cl.[3] F04B *9/10*

U.S. Cl. 417—377 4 Claims



1. An hydraulic pump system for pumping liquids from deep wells, comprising:

(a) a down hole pump attached to the bottom end of a tubing string of inner diameter D1, hung from the surface and immersed in well liquid, comprising;

(1) a large diameter cylinder (LDC) closed at the top and open at the bottom and of diameter D2 less than D1;

(2) a small diameter cylinder (SDC) open at the top of diameter D3 less than D2, with a foot check valve in the bottom of said SDC; said LDC and SDC connected together at their open ends;

(3) a large piston in said LDC is connected to a small

piston in said SDC by means of a common piston rod, and there is a traveling check valve in said small piston;

(4) the bottom end of said LDC and the top end of said SDC communicating with the tubing, whereby liquid lifted by said small piston can flow into and up said tubing;

(b) first pipe means extending from the surface inside said tubing through the closed end of said LDC:

(c) said tubing closed at the surface of the earth and second pipe means connected between the top of said tubing and a first end of a third cylinder enclosing a free traveling piston;

(d) third pipe means connected into the second end of said third cylinder;

(e) high pressure accumulator means, and fourth pipe means connected to said high pressure accumulator means;

(f) sump means and fifth pipe means connected to said sump means;

(g) continuous motor-driven liquid pump (MDLP) means;

(h) valve means adapted to move back and forth between a first position and a second position and wherein;

(1) when said valve means is in said first position, said (MDLP) is connected at its input to said fifth pipe means, and on its output to said first pipe means, and said third pipe means is connected to said fourth pipe means; and

(2) when said valve means is in said second position, said (MDLP) is connected at its input to said fourth pipe means, and on its output to said third pipe means; and said first pipe means is connected to said fifth pipe means;

(i) first pressure sensitive valve means connected to said second pipe means; and

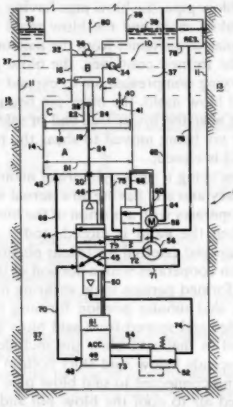
(j) means responsive to the volume flow of liquid to move said valve means between said first and second positions.

4,234,295

SUBSURFACE HYDRAULIC PUMP USING HIGH PRESSURE ACCUMULATOR

James B. Jensen, Rte. 2, Coffeyville, Kans. 67337

Filed Feb. 1, 1979, Ser. No. 8,419
Int. Cl.³ F04B *9/10*
U.S. Cl. 417—390 **3 Claims**



1. In a well having a tubing string supported from the surface, a subsurface hydraulic pump using high pressure accumulator, comprising;

(a) a subsurface hydraulic reciprocating first pump, comprising

(1) a large diameter cylinder (LDC) open at one end and first piston;

(2) a small diameter cylinder (SDC) open at one end and second piston;

(3) said first and second pistons connected by a common piston rod;

(4) said LDC and SDC connected together at their open ends, the space between said pistons open to well liquids;

(b) said hydraulic pump supported by said tubing at the bottom end thereof;

(c) an inlet check valve in the closed end of said SDC, permitting inflow of well liquid into said SDC;

(d) an outlet check valve in the closed end of said SDC, permitting outflow of liquid from said SDC into the bottom of said tubing;

(e) second pump and motor means for producing pressurized control liquid to operate said first piston in said LDC;

(f) high pressure accumulator means;

(g) first valve means operable from a first position, in which liquid is drawn from said LDC and pumped under pressure into said accumulator, thereby lowering said first and second pistons; to a second position in which liquid is pumped from said accumulator to said LDC, raising said first and second pistons; and

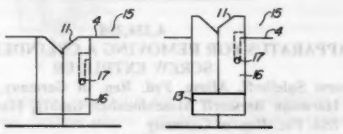
(h) means to apply electrical power to said motor driving said second pump.

4,234,296

SCREW COMPRESSOR

Katsumi Matsubara; Shigekazu Nozawa; Masaharu Ishii, and Mitsuhiko Miyagawa, all of Shimizu, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 6, 1979, Ser. No. 46,025
Claims priority, application Japan, Jun. 14, 1978, 53-70945
Int. Cl.³ F01C *1/16*; F04C *2/00*
U.S. Cl. 418—201 **4 Claims**



1. A screw compressor comprising:

a male rotor and a female rotor in meshing engagement with each other and forming a pair;

a rotor casing enclosing said pair of rotors and cooperating therewith to define a working chamber for compressing gas;

an axial discharge port and a radial discharge port formed such that the former is smaller in area than the latter; and

a slide valve mounted at one part of said rotor casing for axial movement, said slide valve being operative to return gas from said working chamber to the low pressure side of the compressor;

wherein the improvement comprises a duct formed in said slide valve for establishing communication between the working chamber and the discharge port side of the compressor only when the compressor operates in a controlled capacity mode.

4,234,297

APPARATUS FOR BLOW MOLDING

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

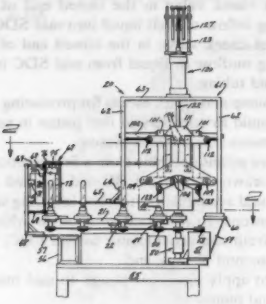
Division of Ser. No. 886,488, Mar. 14, 1978. This application Jan. 9, 1979, Ser. No. 2,146
Int. Cl.³ B29C *17/07*
U.S. Cl. 425—174.4 **6 Claims**

1. In a blow molding apparatus, conveying means adapted to

traverse a plurality of spaced operating stations in stepwise fashion,

a plurality of spaced parison support elements carried by said conveying means and adapted to support parisons at the same spacing as said stations, the parisons being located at said stations in succession as the conveying means traverses said stations,

separate infrared radiant heaters located at some of said



stations, blow molding means located at another of said stations,

a fixed heating tunnel enclosing the parisons located at all of the heating stations having said radiant heaters, and

blower means for introducing air under pressure into said tunnel for flow past all of said heating stations, said blower means being operatively associated with said tunnel to blow air counter-current to the path that said conveying means traverses said stations.

4,234,298

APPARATUS FOR REMOVING A CYLINDER FROM A SCREW EXTRUDER

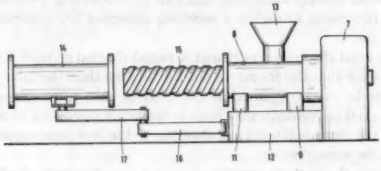
Horst Spielhoff, Aligse, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover Kleefeld, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,813

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726963

Int. Cl.³ B30B *15/28*

U.S. Cl. 425—186 **1 Claim**



1. Apparatus for removing a cylinder of a screw extruder comprising

(a) a base;

(b) a first cylinder, and means for fixedly mounting said first cylinder on said base;

(c) a second cylinder adapted to be aligned with and connected to said first cylinder for receiving an extruding member;

(d) a first supporting arm;

(e) means for pivotally mounting one end of said first supporting arm on said second cylinder;

(f) a second supporting arm;

(g) means for pivotally mounting one end of said second supporting arm to the other end of said first supporting arm;

(h) means for pivotally mounting the other end of said second supporting arm to said base of said extruder, whereby said second cylinder can be swung clear of said first cylinder and the remaining parts of the screw extruder, and

(i) adjusting means disposed between second cylinder and said first supporting arm for adjusting the height and inclination of said cylinder with respect to said first supporting arm, said adjusting means comprising a plate mounted on said one end of said first supporting arm, adjusting set-screws screwed into said plate and adapted to bear against said second cylinder, and securing screws extending through said plate and engaged in screw threaded apertures in said second cylinder for maintaining the same in its adjusted position.

4,234,299

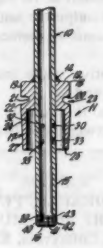
BLOW PIN CONSTRUCTION IN A PLASTIC BOTTLE BLOW MOLDING MACHINE

Ernest O. Kuenzig, Glen Head, and Frank L. Pennino, Farmingdale, both of N.Y., assignors to Forest Mechanical Products Corp., Kew Gardens, N.Y.

Filed Jun. 19, 1979, Ser. No. 49,914

Int. Cl.³ B29C *17/07, 17/10*

U.S. Cl. 425—292 **9 Claims**



1. A blow pin for use in a blow molding machine;

said blow molding machine forming plastic containers with integral handles by extruding a hot tubular plastic parison around a blow pipe, the blow pipe having a lower free end within a blow mold and the blow mold being closed to form the plastic container from the parison and opened to remove the formed container, the blow pipe at selected times carrying compressed air to expand the parison into the closed blow mold, the blow pin being secured to the blow pipe near the lower free end of said blow pipe and said blow pin being moved to shear the parison after the blow mold is closed;

said blow pin being a right cylindrical member centered on an imaginary axis and having an external wall seal portion which cooperates with a portion of the blow mold to form a seal when the mold is closed, and a tubular portion having a tapered external wall shear portion with a cutting edge which cooperates with a portion of the blow mold to sever the formed parison upon shearing movement of the blow pin; said tubular portion forming a skirt having a bottom edge and spaced from said blow pipe;

characterized in that said blow pin includes a tube means which descends below said skirt bottom edge; said tube means being connected to said blow pipe so that it expels compressed air to cool the blow pin and to expand said parison; a portion of said tube means being positioned within said skirt and having a plurality of orifices to expel air directed at said skirt; said tube means having a plurality of guide orifice means below said skirt portion and adjacent said integral handles to properly form the integral handles, each of said guide orifice means being directed upwardly in the range of 25° to 45° and having their

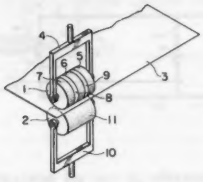
orifice means centers positioned in the range of between 2.0 and 3.5 inches from said shear portion cutting edge.

4,234,300

EDGE EMBOSSING DEVICE

Kikuo Yamagisi; Hiroshi Okuyama, and Hideo Kawaguchi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 28, 1978, Ser. No. 964,404
Claims priority, application Japan, Nov. 28, 1977, 52/142470
Int. Cl.³ B29C *15/00*
U.S. Cl. 425—363 5 Claims



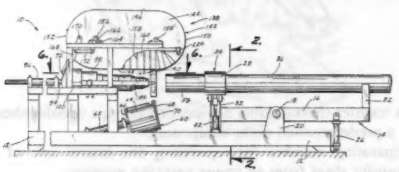
1. In an embossing device for deforming a lateral edge of a molded thermo-plastic sheet by mechanical means, the improvement comprising, first and second embossing rollers disposed in an opposed relationship on opposite sides of said sheet, said rollers having solid cylindrical outer walls having an exterior embossing pattern thereon composed of a plurality of small, raised surface projections, and at least one of said rollers having at least one intermediate circumferential stripe of a relatively smooth surface devoid of said raised projections, said rollers having a width equal to the width of the lateral edge portion of the sheet being embossed.

4,234,301

GASKET FEEDING APPARATUS FOR AN INPLACE GASKET BELLING MACHINE

Fay A. Hayes, 242 NW. 12th Ave., Boca Raton, Fla. 33432, and Leonard L. Hayes, 1906-10th Ave., Lewiston, Id. 83501

Division of Ser. No. 902,443, May 3, 1978. This application Mar. 19, 1979, Ser. No. 21,584
Int. Cl.³ B29C *17/00*; B23Q *7/10*
U.S. Cl. 425—392 6 Claims



1. In an inplace gasket belling machine, an apparatus for automatically placing annular gaskets onto an elongated belling mandrel comprising,

a gasket magazine including a plurality of gasket receiving compartments,

means for supporting said gasket magazine on the machine adjacent said mandrel,

said gasket magazine having an opening adapted for registration with a compartment for dispensing a gasket from said compartment through said opening,

means for advancing said compartments within said magazine for sequentially registering each compartment with said opening,

a gasket holding device positioned for receiving a gasket dispensed from said magazine,

said gasket holding device having an aperture therethrough adapted for registration with an annular gasket held therein, and

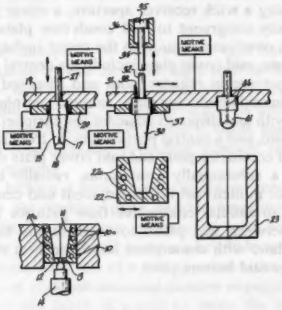
support means for supporting said device on the machine with said aperture in longitudinal alignment with the mandrel for receiving the mandrel through said aperture and annular gasket.

4,234,302

APPARATUS FOR THE PREPARATION OF HOLLOW PLASTIC ARTICLES

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Division of Ser. No. 911,359, Jun. 1, 1978, which is a continuation-in-part of Ser. No. 641,638, Dec. 17, 1975, Pat. No. 4,115,494, which is a division of Ser. No. 479,287, Jun. 14, 1974, Pat. No. 3,970,419, which is a continuation-in-part of Ser. No. 473,580, May 28, 1974, Pat. No. 3,966,378. This application Jan. 24, 1979, Ser. No. 5,962
The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.
Int. Cl.³ B29C *17/07*
U.S. Cl. 425—526 6 Claims

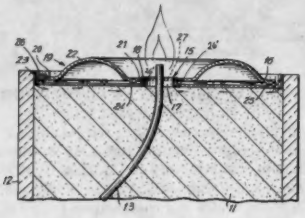


1. A blow molding apparatus for forming a plurality of oriented, blown, hollow plastic articles of moldable plastic material which comprises: a plurality of first molds for tempering a plurality of parisons in spaced relationship to each other and having a first center spacing; a plurality of first cores engageable with said first molds and being in fixed, spaced relationship to each other corresponding to said first center spacing; a plurality of blow molds in spaced relationship to said first molds for forming said tempered parisons into oriented, blown, hollow plastic articles, said blow molds being in spaced relationship to each other and having a second center spacing greater than said first center spacing; a plurality of second cores in spaced relationship to said first cores and to each other corresponding to said first center spacing, said second cores being spaced from and engageable with said first molds; means operatively associated with said second cores for moving said second cores away from and towards each other to change the center spacing thereof from said first center spacing to said second center spacing so that said second cores are aligned with said first molds for engagement therewith and are aligned with said blow molds for engagement therewith; means including said plurality of first cores for providing a parison in each of said first molds; means operatively associated with said second cores for placing said second cores in said first molds and in said parisons; means operatively associated with said second cores for removing said second cores with parisons contained thereon from said first molds at the end of the tempering cycle prior to orienting and blowing; and means operatively associated with said second cores for placing said second cores with parisons thereon in said blow molds.

4,234,303
COMBUSTION APPARATUS

Fernando M. Neugart, 32-21 37th St., Astoria, N.Y. 11103

Filed Oct. 10, 1978, Ser. No. 949,662
Int. Cl.[3] F23D 3/16
U.S. Cl. 431—293 6 Claims

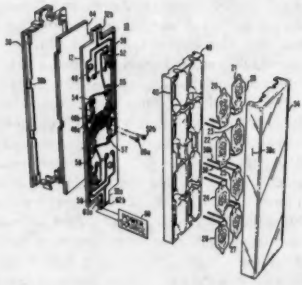


1. A combustion apparatus for use with a low temperature meltable solid fuel, such as paraffin, comprising, in combination, a bottom, generally planar conductor plate formed of metal and having a high thermal conductivity factor, said plate including a central bore extending transversely therethrough and defining a wick receiver aperture, a cover plate member substantially congruent to said conductor plate and secured thereto in overlying relation to the upper surface of said conductor plate, said cover plate including a central portion defining an aperture in registry with and disposed adjacent the aperture in said conductor plate, an outer peripheral portion in registry with and disposed adjacent the periphery of said conductor plate, and a central portion spaced from said conductor plate, said conductor plate and said cover plate defining therebetween a substantially continuous, radially directed flow passage for molten fuel heated adjacent said central aperture, whereby an annular convective flow path for heated fuel is created between said plates to augment the heating of said bottom plate, with consequent improved heat transfer to the fuel below said bottom plate.

4,234,304
CIRCUIT BOARD HAVING CONDUCTOR RUNS RESISTANT TO FORMATION OF NON-CONDUCTIVE LOCALIZED AREAS AND METHOD

Herman R. Heytmeijer, Hanover Township, Morris County, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 11, 1978, Ser. No. 923,596
Int. Cl.[3] F21K 5/02; G03B 15/02; H01B 1/20
U.S. Cl. 431—359 17 Claims



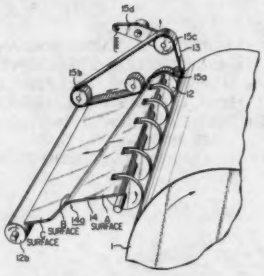
1. In combination with a circuit board comprising a non-conductive substrate having electrical circuitry affixed thereto, the improvement which comprises:

electrical conductor runs forming a part of said electrical circuitry adhered to and carried on said substrate, said conductor runs comprising small vitreous bead-like particles having a thin silver coating carried thereon with the surface of said silver-coated bead-like particles comprising a triazole-silver water-insoluble reaction product, said bead-like particles adhered to said substrate by a matrix of organic polymer binder, and the relative proportion of said bead-like particles to said polymer binder being such that adjacently positioned bead-like particles are in electrically conductive relationship with one another to provide a resistivity of less than about 0.03 ohm-cm for said runs, whereby said triazole reacted surface of said bead-like particles substantially inhibits the formation of non-conductive localized areas in said conductor runs.

4,234,305
TRANSFER SHEET GUIDING DEVICE

Hiroyuki Miyake, Inagi; Kazumi Umezawa, Kawasaki; Hiroshi Ogawa, Yokohama; Hitotoshi Kishi, Tokyo; Seiji Sagara, Kawasaki, and Hiroshi Hara, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,780
Claims priority, application Japan, Nov. 24, 1977, 52/141003; Dec. 1, 1977, 52/144310; Feb. 15, 1978, 53/15374
Int. Cl.[3] F27B 9/28; B65H 29/16, 29/56
U.S. Cl. 432—59 10 Claims



1. A transfer sheet guiding device for guiding a transfer sheet along a predetermined path, comprising:

a separating member for separating one lateral side of a transfer sheet from an image carrying member;

a rotary body, located adjacent said one lateral side, for gripping the separated side of the transfer sheet and guiding the same in a direction away from the image carrying member;

a guide member provided downstream of said rotary body and having a stepped portion which extends across the transport path of said transfer sheet in such a manner that the position of said stepped portion is progressively disposed further downstream in the advancing direction of the transfer sheet from the side where said rotary body is provided to the opposite side; and

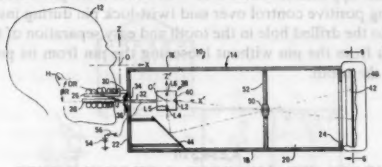
a rotary member which extends along said rotary body and said guide member adjacent said one lateral side for gripping the separated side of the transfer sheet and guiding it at least along said stepped portion in cooperation with said rotary body and guide member.

4,234,306

METHOD AND APPARATUS FOR SENSING JAW POSITION AND MOVEMENTS AND UTILIZING SENSED DATA

James H. Hamada, Los Altos; Jeffrey R. Bender; Earl T. Price, both of San Jose, all of Calif., and Dennis A. Ingebretsen, Oakton, Va., assignors to HBTI, San Jose, Calif.

Filed Jul. 18, 1979, Ser. No. 58,689
Int. Cl.[3] A61C 11/02
U.S. Cl. 433—55 21 Claims



1. Dental apparatus for use in obtaining jaw movement information comprising,

relatively movable indicia-bearing and light responsive means,

image-forming means for providing images of indicia at said indicia-bearing means on said light responsive means, and

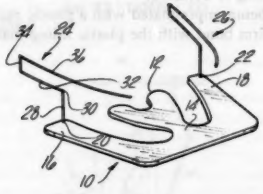
means for attaching said indicia-bearing and light responsive means to a patient's jaws to provide jaw position data at said light responsive means upon relative movement of the patient's jaws and attached indicia-bearing and light responsive means.

4,234,307

OCCLUSAL PLANE ORIENTATION GUIDE

Frederick E. Draheim, 4781 Surfwood Dr., Milford, Mich. 48042

Filed Feb. 8, 1979, Ser. No. 10,446
Int. Cl.[3] A61C 19/04
U.S. Cl. 433—73 2 Claims



1. A guide for use in orienting the occlusal plane of a denture set to the cranial anatomy of a patient comprising:

a thin planar plate having a central curved bite piece and a pair of laterally and distally extending wings projecting in opposed directions from the proximal end of the bite piece and adapted to extend in the occlusal plane over the opposed cheeks of the patient when the bite piece is engaged by the opposed denture sections;

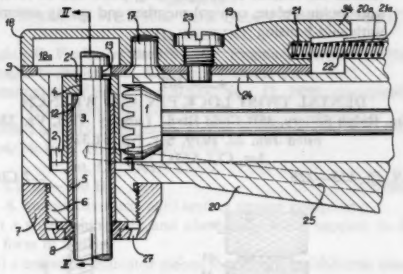
and a pair of guide wire extensions, each extension having one end section slidably supported within an aperture in the wing formed laterally to the plane of the plane and an opposite end section projecting parallel to the wings of the plates whereby the parallel end sections of the extensions may be aligned with the ala-tragus line or the patient by sliding and rotation of the first end sections in their supporting wing apertures to allow proper orientation of the occlusal plane with respect thereto.

4,234,308

DEVICE FOR LOCKING A TOOL IN A DENTAL HANDPIECE

Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., Besancon, France

Filed Apr. 20, 1978, Ser. No. 898,022
Claims priority, application France, Jun. 7, 1977, 77 17974
Int. Cl.[3] A61C 1/14
U.S. Cl. 433—127 1 Claim



1. A dental handpiece of contra-angle type comprising a housing including a head for receiving a tool having a shank with a groove near the end of the shank, means in said housing for driving said tool, said housing having in its upper portion an opening through which said grooved shank end of a tool extends, and longitudinally extending grooves on opposite sides of said opening,

means for locking a tool in said handpiece comprising an elongate flat locking plate slidable lengthwise in said longitudinally extending grooves of said housing and having in a forward end portion a key-hole opening having a forward portion of a size to receive the shank of a tool and an elongate rearward portion engageable in said groove in the shank of a tool to retain the tool in said handpiece,

an elongate control member overlying and fixed to said locking plate, said control member having in a forward end portion a downwardly opening recess overlying said opening of said locking plate, and a rear end portion which is thicker than said forward end portion, and has an upper surface between said forward end portion and rear end portion which is inclined rearwardly and upwardly,

said housing having an upward projection rearwardly of said control member, and said upward projection of the housing and the rear end of said control member having aligned longitudinally extending bores, a compression spring received in said bores and acting between said control member and said upward projection of the housing to urge said control member and locking plate forwardly to bring said elongate portion of said opening in the locking plate into engagement with said groove of the shank of a tool received in said head to retain said tool, and means for limiting longitudinal movement of said locking plate and control member relative to said housing,

said locking plate being moveable rearwardly against the action of said spring to release a tool by digital pressure on said upwardly and rearwardly inclined surface of said control member,

said control member having a rearwardly extending tail portion which overlies and thereby covers said spring and, in a rearward position of said control member, overlies said upward projection of the housing, and

said means for limiting longitudinal movement of said locking plate and control member comprising a screw extending through a threaded hole in a mid-portion of said control member and having an inner end portion extending

into an elongate recess of limited length in the upper surface of said housing,

whereby said locking plate, control member and spring are assembled on said housing by sliding said locking plate in said grooves, positioning said spring in said bores, moving said locking plate and control member rearwardly to compress said spring, and screwing said screw inwardly to engage its inner end in said recess of the housing, whereupon said screw serves the dual function of limiting longitudinal movement of said locking plate and of retaining said locking plate, control member and spring assembled with said housing.

4,234,309

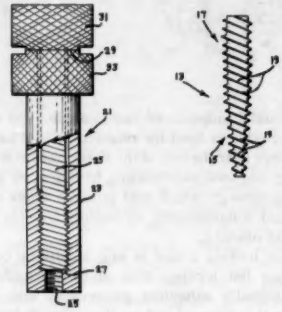
DENTAL TWIST LOCK PIN AND WRENCH

Wm. Ralph Sellers, 35B Codd Blvd., Langley AFB, Va. 23665

Filed Jun. 22, 1979, Ser. No. 51,316

Int. Cl.[3] **A61C** *5/04*

U.S. Cl. 433—225 **2 Claims**



1. In combination, a twist-lock pin for insertion into a tapered hole drilled into sound tooth structure and a wrench for holding the pin during insertion, said twist-lock pin having a left-hand thread on the outer surface thereof, said twist-lock pin having a tapered lower portion for engagement with the drilled tooth and a straight threaded upper portion for threadable engagement with the wrench; and said wrench comprising a wrench body of substantially cylindrical configuration with a left-hand threaded opening in the lowermost end thereof, the upper portion of said twist-lock pin being in threadable engagement with the left-hand threaded opening in said wrench body, the lower portion of the inner surface of said wrench body having right-hand threads thereon, a limiting screw having right-hand threads on the outer surface of the lower portion thereof for engagement with the right-hand threads in the lower portion of said wrench body, means for limiting the travel of said limiting screw in said wrench body so that the lowermost surface of said limiting screw is in direct contact with the uppermost surface of said twist-lock pin thereby allowing positive control over said twist-lock pin during insertion into the drilled hole in the tooth and easy separation of the wrench from the pin without loosening the pin from its position in the tooth.

4,234,310

POROUS CERAMIC DENTAL FILLING INSERT

Paul E. Leuthard, Bahnhofstrasse 26, Zürich, Switzerland

Filed Feb. 14, 1978, Ser. No. 877,654

Claims priority, application Switzerland, Feb. 25, 1977, 2437/77

Int. Cl.[3] **A61K** *5/01*

U.S. Cl. 433—228 **7 Claims**

1. In a dental filling including a conventional plastic filling material adapted to be located in a cavity drilled in a tooth, the improvement comprising:

a preformed, abrasive resistant, porous ceramic insert embedded in the conventional plastic filling material,

said insert having an outer shape different from and unrelated to the shape of the cavity,

said insert having an exposed surface adapted to be aligned with the surface of the tooth to improve resistance of the dental filling to abrasion,

said insert being impregnated with a plastic material which forms a firm bond with the plastic filling material.

4,234,311

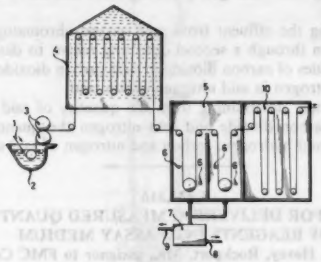
PROCESSES FOR REMOVING IMPURITIES FROM TEXTILE MATERIALS

Manfred Schuierer, Michelstadt, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Erbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 861,532, Dec. 19, 1977, abandoned. This application Jun. 27, 1979, Ser. No. 52,349

Int. Cl.[2] D01C *3/02;* D06L *1/06;* B08B *3/08*

U.S. Cl. 8—138 25 Claims



1. A process for removing polymeric impurities from textile material comprising applying to said material an aqueous solution in which said impurities are soluble or degradable; exposing said material to saturated steam after the application of the aqueous solution for a period of between 10 seconds and 10 minutes while avoiding the depositing of said material in folds; and subsequently physically displacing said aqueous solution together with said impurities from said material by spraying into said material an organic solvent having a specific gravity greater than that of water and being immiscible with water.

4,234,312

PROCESS AND DEVICE FOR THE CONTINUOUS SPINNING OF VISCOSE RAYON

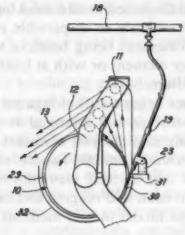
Ugo Paoletti, Monza, and Alessandro Volterra, Milan, both of Italy, assignors to Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Oct. 12, 1978, Ser. No. 950,611

Claims priority, application Italy, Oct. 25, 1977, 28923 A/77

Int. Cl.[3] D06B *1/00*

U.S. Cl. 8—151.2 8 Claims



1. In a process for the continuous spinning of viscose rayon yarns, wherein each of a plurality of yarns is caused to travel as coils in a substantially helicoidal path, partly over a treatment roller and a respective advancing roller, while being subjected to a plurality of liquid treatment operations followed by a drying treatment, the improvement of eliminating a portion of the liquid carried by said yarns from said liquid treatment operation before passage to said drying treatment, said improvement comprising:

directing a blade-shaped jet of air having a maximum dimension extending in a direction parallel to the axis of said treatment roller against at least one coil of each of said yarns, at a position thereof in contact with said treatment roller, and against said treatment roller, said jet of air being directed in a direction substantially tangential to said treatment roller and to said substantially helicoidal paths of said yarns at said position, and said jet of air contacting said yarn coils and said treatment roller at a location immediately preceding said drying treatment.

4,234,313

DEVICE AND METHOD FOR QUANTITATIVE URIC ACID TESTING

Douglas E. Faulkner, Bexleyheath, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 630,814, Nov. 11, 1975, abandoned. This application Jun. 5, 1978, Ser. No. 912,349

Claims priority, application United Kingdom, Nov. 11, 1974, 48714/74; Nov. 11, 1974, 48715/74

Int. Cl.[3] G01N *33/52, 21/78, 31/22*

U.S. Cl. 23—230 B 21 Claims

1. A quantitative uric acid testing device comprising:

(a) a solid, physically and chemically inert, support in the form of a strip;

(b) a coloured indicator means for comparing the concentration of uric acid in an aqueous test sample with a preselected concentration limit of uric acid within the range of 5 to 9 mg/100 ml sample, said means being capable of being reduced into a colourless form and being provided on said support in an amount adjusted so as to be equivalent to said preselcted concentration limit so that when said support is saturated with the test sample, said indicator completely loses its colour if the uric acid concentration in said sample is equal to or higher than said preselected concentration limit of uric acid, the colour loss being in consequence of other than a change in pH; and

(c) protective means for preventing particles suspended in said test sample coming into contact with said support and said indicator.

4,234,314

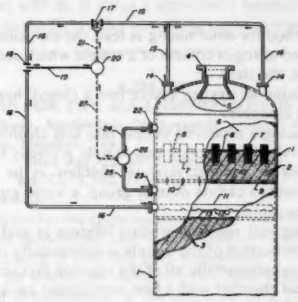
GUARD-BED VAPOR BYPASS TO OVERCOME PRESSURE DROP IN MIXED-PHASE REACTIONS

Evan A. Jones, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 25, 1978, Ser. No. 945,767

Int. Cl.[3] G01N *7/00;* G01D *7/00, 16/00*

U.S. Cl. 23—230 A 4 Claims



1. In a catalytic hydrocarbon conversion process in which (1) a mixed-phase hydrocarbon reactant stream initially contacts a guard bed of particulate matter disposed above and spaced from one or more beds of catalyst particles in a reaction zone, the guard bed and the one or more beds of catalyst being disposed in vessel means, and, (2) the pressure drop across the

guard bed increases during the processing period, the method of reducing the overall reaction zone pressure drop which comprises the sequential steps of:

(a) introducing said mixed-phase hydrocarbon reactant stream into the upper portion of said reaction zone above said guard-bed and distributing the reactant stream across the upper surface of the particulate matter therein;

(b) sensing the pressure differential across said guard-bed, comparing the sensed pressure differential with the pressure differential designated and predetermined by an adjustable set point of a differential pressure controller and developing a signal representative of the resulting comparison;

(c) withdrawing a vaporous reactant stream from the upper portion of said reaction zone above said guard bed and external to said vessel means and regulating the quantity thereof in response to said signal; and,

(d) reintroducing the withdrawn vaporous reactant stream into the space within said reaction zone between said guard-bed and the catalyst bed below the guard-bed.

4,234,315

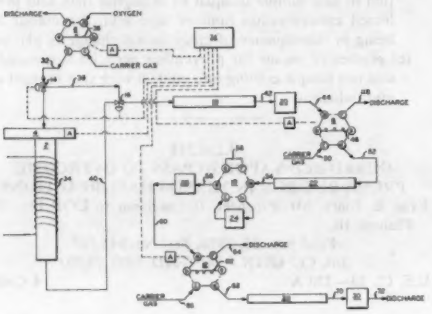
GAS CHROMATOGRAPHIC ANALYSIS METHOD AND APPARATUS

Richard L. Scott, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 779,411, Mar. 18, 1977, abandoned, and Ser. No. 735,359, Oct. 26, 1976, abandoned. This application Sep. 29, 1978, Ser. No. 947,231

Int. Cl.³ G01N *31/08, 31/12*

U.S. Cl. 23—230 PC **116 Claims**



70. A method for determining at least the elemental carbon, hydrogen and nitrogen content of a sample which comprises in combination, the steps of:

a. introducing an oxygen source into a closed, heated combustion chamber,

b. introducing a measured sample into said chamber,

c. oxidatively decomposing said sample whereby the resulting reaction product mixture contains as its principal components a carbon dioxide group, a water group and a nitrogen group,

d. retaining said reaction product mixture in said chamber until combustion of the sample is substantially complete,

e. sweeping substantially all of the reaction product mixture from said chamber with a first inert carrier gas at a predetermined flow rate,

f. passing said reaction product mixture and said inert gas through a first gas chromatographic column whereby said mixture is separated into said carbon dioxide group, said nitrogen group and said water group, said carbon dioxide group and said nitrogen group being eluted substantially simultaneously and prior to said water group,

g. passing the water group effluent eluting from said first column through a first detecting means to detect the quantity of water in said water group,

h. passing the carbon dioxide group and the nitrogen group effluent eluting from said first detecting means to a second gas chromatographic column,

i. introducing a second carrier gas at a predetermined flow rate to the inlet of said second column thereby passing said carbon dioxide group and said nitrogen group through said second column whereby said nitrogen group and said carbon dioxide group are further separated,

j. venting said water group eluting from said first detecting means,

k. passing the effluent from said second chromatographic column through a second detecting means to detect the quantities of carbon dioxide in said carbon dioxide group and nitrogen in said nitrogen group, and

l. separately determining from the quantity of said water, said carbon dioxide and said nitrogen the quantities of elemental hydrogen, carbon and nitrogen of said sample.

4,234,316

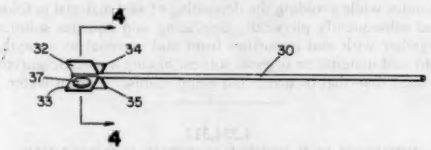
DEVICE FOR DELIVERING MEASURED QUANTITIES OF REAGENTS INTO ASSAY MEDIUM

Richard C. Hevey, Rockport, Me., assignor to FMC Corporation, Philadelphia, Pa.

Filed Apr. 2, 1979, Ser. No. 25,997

Int. Cl.³ G01N *33/50*

U.S. Cl. 23—230 R **11 Claims**



1. A device for precise quantitative introduction of a plurality of reagents into a liquid aqueous assay medium; said device comprising a water-impervious solid support member which is chemically inert to the reagents and to the material to be assayed,

secured to one or more faces of said support member two or more discrete and separate elements consisting essentially of carrier solid organic binder which is soluble or dispersible in water, and dispersed in said solid binder a measured quantity of water-soluble or dispersible reagent, the reagent in each said element being reactive with at least one reagent in another element or with at least one constituent in said assay medium,

said support member being a stiff elongated member having one portion constructed and arranged as a handle for said device, and having said discrete elements secured to portions thereof removed from said handle, said handle facilitating contact of said discrete elements with liquid assay medium to permit each said reagent and binder to dissolve completely and be mixed in said medium.

4,234,317

APPARATUS AND METHOD FOR FRACTIONATION OF LIPOPROTEINS

Flordeliza F. Lucas, Daly City, and Ronald B. Smernoff, Belmont, both of Calif., assignors to Analytical Products, Inc., Belmont, Calif.

Filed May 24, 1979, Ser. No. 42,011

Int. Cl.³ G01N *31/00*

U.S. Cl. 23—230 B **16 Claims**

11. A method of fractionating a plasma or serum blood sample comprising:

adding said sample having a low density lipoprotein content

and a high density lipoprotein cholesterol content to a first chamber within a column, said first chamber having a plurality of inert members having a large surface area coated with a substantially dry reagent aliquot, said sample being within a predetermined volumetric range sufficiently small for said reagent aliquot to substantially completely flocculate said low density cholesterol and to form a reacted plasma sample including a flocculant having

substantially all of the low density lipoprotein cholesterol and a supernatant of substantially unchanged high density lipoprotein cholesterol concentration and being substantially low density lipoprotein cholesterol depleted;

transferring said reacted plasma sample from said first chamber to a second chamber, said second chamber having flocculant separating means therein; and

collecting said supernatant which has been separated from said flocculant from said second chamber.

4,234,318

PROCESS FOR GRANULATION OF SULFUR

John T. Higgins, Trail, and Gordon C. Hildred, Calgary, both of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Feb. 6, 1978, Ser. No. 875,369

Claims priority, application United Kingdom, Feb. 4, 1977, 04566/77

Int. Cl.[3] **B01J** *2/12, 2/16;* **B05D** *1/02*

U.S. Cl. 23—293 S **4 Claims**

1. A process for producing granular sulfur which comprises the steps of forming and maintaining in a rotating horizontally elongated granulating vessel a bed of continuously moving solid particles of sulfur by adding finely divided solid particles of sulfur to said bed, advancing said particles through said granulating vessel, spraying molten sulfur at a spray pressure in the range of about 100 to 400 kPa and at a temperature 10° to 40° Celcius degrees above the sulfur melting temperature onto said bed and into a continuously cascading curtain of solid particles extending substantially the length of said granulating vessel, simultaneously contacting the continuously cascading curtain of particles with a current of substantially inert cooling gas flowing countercurrently to the direction of the advance of said particles, passing said particles from said granulating vessel to a rotating horizontally elongated cooling vessel, advancing said particles through said cooling vessel, forming a bed of continuously moving solid particles of sulfur and a continuously cascading curtain of solid particles in and extending substantially the length of said cooling vessel, simultaneously contacting the advancing particles in said cooling vessel with a current of substantially inert cooling gas flowing countercurrently to the direction of advance of said particles, withdrawing cooled solid particles from said cooling vessel, separating cooled solid particles within a predetermined size range from said withdrawn cooled solid particles as product granules, recycling cooled solid particles smaller than those within said predetermined size range as finely divided solid particles of sulfur to said granulating zone at ratios in the range of from 4:1 to 2:1 of finely divided particles to product granules, said withdrawing, separating and recycling being carried out in the presence of substantially inert cooling gas, said substantially inert cooling gas containing not more than 8% by volume of oxygen and being circulated by an integrated and closed gas system comprising said granulating vessel, said cooling vessel and a gas cooler, cooling said cooling gas in said gas cooler to a temperature in the range of about 10° to 50° C., introducing said cooled cooling gas into said cooling vessel, passing said cooling gas through said coolng vessel, cooling a portion of said cooling gas from said cooling vessel to a temperature in the range of about 10° to 50° C., passing said cooled portion of said cooling gas through said granulating vessel, combining the remaining portion of cooling gas from said cooling vessel with cooling gas passed through said granulating vessel and passing said combined cooling gas to said gas cooler.

4,234,319

PROCESS FOR CHANGING CAKING COALS TO NONCAKING COALS

Justin L. Beeson, Woodridge, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 25, 1979, Ser. No. 33,076

Int. Cl.[3] **C10L** *9/02, 9/06*

U.S. Cl. 44—1 R **3 Claims**

1. A method of rendering caking coals noncaking by treating with a water slurry of an alkaline earth metal hydroxide, consisting of:

forming an aqueous slurry mixture of coal and alkaline earth metal hydroxide at about 1 atmosphere pressure in air with the alkaline earth metal hydroxide being about 1–10 weight percent of the amount of coal included therein;

maintaining said slurry mixture in contact with air at about 1 atmosphere pressure and at a temperature near to its boiling point for about 1 hour;

removing the water from said slurry mixture by mechanical dewatering followed by heating to dryness in contact with air at about 1 atmosphere pressure and at about the slurry boiling temperature whereby slurry solids remain; and

heating the slurry solids to a temperature of about 300° F. in contact with air at about 1 atmosphere pressure for about 1–2 hours to form a dry noncaking carbonaceous material.

4,234,320

PROCESS FOR THE AGGLOMERATION OF SOLIDS

Eke Verschuur, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 23, 1979, Ser. No. 32,063

Int. Cl.[3] **C10L** *5/14, 5/16;* **C22B** *1/14*

U.S. Cl. 44—23 **10 Claims**

1. A process for the agglomeration of finely divided solids in an aqueous suspension, said solids being selected from the group consisting of ores and coal, comprising:

passing the suspension through a first zone where it is subjected to turbulence in the presence of a hydrocarbon binder having a softening point between 30° C. and 120° C. which causes loose agglomerates to be formed;

substantially separating the agglomerates from the water; and,

passing the agglomerates to a second zone containing hot water and subjecting the agglomerates to turbulence in the presence of a hydrocarbon binder having a softening point between 30° C. and 120° C.

4,234,321
FUEL COMPOSITIONS CONTAINING DEPOSIT CONTROL ADDITIVES

Jennifer E. Lilburn, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

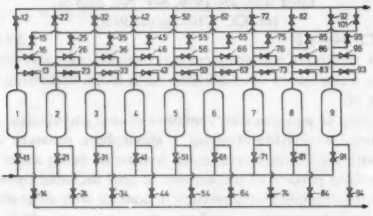
Filed Aug. 8, 1978, Ser. No. 931,233
Int. Cl.³ C10L 1/22
U.S. Cl. 44—72 **23 Claims**

1. A fuel compostion comprising a major amount of hydrocarbons boiling in the gasoline range, and from 30 to 2,000 ppm of a hydrocarbylpoly(oxyalkylene) ureylene carbamate of molecular weight from about 600 to 10,000; wherein said hydrocarbylpoly(oxyalkylene) moiety is composed of oxyalkylene units selected from 2 to 5 carbon oxyalkylene units of which at least a sufficient number are branched chain oxyalkylene units to render said carbamate soluble in said fuel composition, and said hydrocarbyl group contains from 1 to 30 carbon atoms.

4,234,322
PRESSURE SWING ADSORPTION PROCESS

Herman De Meyer, Ekeren; Roland Doclo, Schilde-'s Gravenwezel, and Jan Seynaeve, Brasschaat, all of Belgium, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 23, 1979, Ser. No. 41,662
Claims priority, application Fed. Rep. of Germany, May 27, 1978, 2823211
Int. Cl.³ B01D 53/04
U.S. Cl. 55—18 **6 Claims**



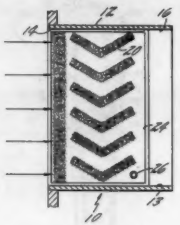
1. In an adiabatic pressure swing adsorption process for separation of gas mixtures by adsorbing at least one gas component in each of at least eight phase staggered operated adsorbent beds;

wherein each of the adsorbent beds is cyclically operated in subsequent operation steps including adsorption, at least two depressurization steps, countercurrent purging, and at least two; repressurization steps; depressurization and repressurization being established by pressure equalization with another adsorbent bed being operated in the operation step repressurization depressurization respectively of adjacent pressure range by means of a number of connecting tubes and valves opening from said adsorbent beds to said connecting tubes; the valves being switched according to a predetermined first valve operation pattern; switching of valves being initiated when a first characteristic physical quantity has reached a predetermined value; the improvement comprising periodically compairing measured actual values with predetermined corresponding nominal values of a second physical quantity characteristic for each operation step; in the case of deviations of the actual values from the nominal values, identifying any valve being potentially defective and therefore potentially responsible for said deviations in any of subsequent operation steps after the first occurence of deviation; identifying the actual defective valve as being the sole valve being identified as potentially defective in any of a sufficient number of operation steps to exclude other valves being also identified as potentially defective in said operation step of first occurance of a deviation; excluding the adsorption bed to which the defective valve belongs from operation by continuing operation of the remaining adsorption beds according to a second valve operation pattern predefined for a such reduced number of adsorption beds.

4,234,323
COLLECTOR FOR WATER SEPARATOR

John F. Maher, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 564,405, Apr. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 475,324, May 31, 1974, abandoned. This application Sep. 29, 1978, Ser. No. 947,213
Int. Cl.³ B01D 45/16
U.S. Cl. 55—97 **4 Claims**



1. The method of removing water from the airstream entering a jet type power plant powering marine vessels so as to remove the corrosive elements in the airstream where the airstream flows at substantially 20 feet per second comprising the steps of:

mounting a plurality of vane-like elements formed from a low porosity material disposed at a predetermined angular relationship to the stream ahead of the inlet of the engine, and each vane-like element spaced relative to each other to form open ended passages where the material of said vane-like element is formed from an array of nonabsorbent fibers prematted into a preformed vane-like element having a thickness between ¼ to 1 inch;

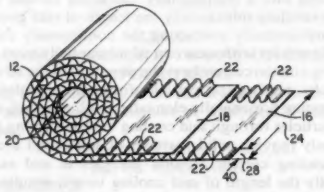
passing the air through said low porosity material such that more than 10% of said air by volume passes through said material and the remaining air passes through said passages at a pressure drop not exceeding substantially 1.0 inch of water; and

collecting by gravity the water entrained in said material.

4,234,324
ELECTROSTATIC FILTER

Cleveland E. Dodge, Jr., Quarry Hill Farm, Pownal, Vt. 05261

Filed Dec. 4, 1978, Ser. No. 965,847
Int. Cl.³ B03C 3/45
U.S. Cl. 55—156 **1 Claim**



1. A filter, comprising:

(a) a first planar electrode made of a very thin sheet of resinous material with a much thinner layer of conductor

deposited thereon and having a length much longer than its width and having planar surfaces and positioned, curvedly configured and dimensioned in such a manner that portions of a planar surface of said first planar electrode face other portions of its planar surfaces;

(b) a second planar electrode made of a very thin sheet of resinous material with a much thinner layer of conductor deposited thereon and having a length much longer than its width and having planar surfaces positioned, curvedly configured and dimensioned to be supported between said facing portions of said planar surfaces of said first planar electrode with portions of its planar surfaces in facing relationship to facing portions of said first planar electrode to define a plurality of paths parallel to the width of said first and second planar electrodes; and

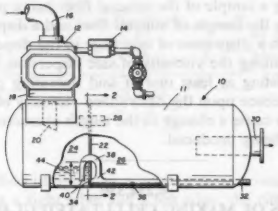
(c) spacer means secured to said first planar electrode to make portions of said first planar electrode substantially rigid with respect to other portions of said first planar electrode and for substantially rigidly securing points on said second planar electrode to said first planar electrode said spacer means comprising a pair of resilient insulative ribbons having a width much less than the width of said planar electrodes which have been corrugated and which are adhered to said first and second planar electrodes.

4,234,325

SILENCER-SEPARATOR WITH INTERNAL TRAP FOR LIQUID SEAL BLOWERS OR THE LIKE

Wayne E. Rea, Connersville, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 19, 1979, Ser. No. 21,389
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—185 **2 Claims**



1. An improved silencer-separator for liquid-sealed gas blowers or the like including a discharge and being provided with water injection means, said silencer-separator including:

a hollow tank having an inlet in communication with the blower discharge, a gas outlet and a liquid drain near the lowermost portion of the tank;

a partition between said inlet and outlet dividing said tank into a first chamber including the inlet and a second chamber including the outlet and the drain;

a gas passageway in said partition located above the anticipated water level in the tank;

an overflow conduit extending through said partition and having an entry end located in the first chamber adjacent the lower portion of the tank and below the water level when the blower is operating and having an outlet end, connected with said liquid drain; and,

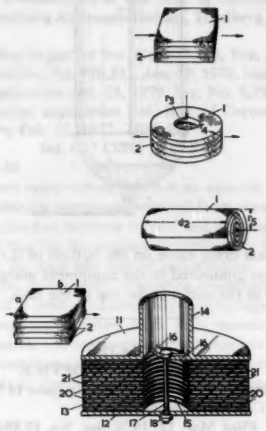
wherein said overflow conduit extends through said partition at a height measured from the lowermost portion of the entry end of the overflow conduit that is greater than the anticipated maximum pressure differential expressed in inches of water between said first chamber and atmospheric pressure.

4,234,326

FILTER ASSEMBLIES WITH LAYERS OF ACTIVATED CARBON FIBROUS CLOTH

Alan Bailey, and Frederick A. P. Maggs, both of Salisbury, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 539,105, Jan. 7, 1975, abandoned, which is a continuation of Ser. No. 376,159, Jul. 3, 1973, abandoned. This application Jul. 26, 1978, Ser. No. 928,145
Claims priority, application United Kingdom, Jul. 5, 1972, 31475/72
Int. Cl.² B01D *46/60, 39/04*
U.S. Cl. 55—278 **8 Claims**



1. A gas adsorption filter comprising

(a) a gas inlet,

(b) a gas outlet, and

(c) a plurality of layers of charcoal cloth composed of activated fibrous carbon, the layers of charcoal cloth being arranged to lie in and substantially parallel to the direction of gas flow between the gas inlet and the gas outlet and being separated from each other by layers of an air permeable material selected from the group consisting of glass fiber, wood fiber, and open celled foam.

4,234,327

COMPRESSED AIR SYSTEM HAVING AN AIR DRYER

Bill R. Wills, 4522-77th, Lubbock, Tex. 79424

Filed Jun. 4, 1979, Ser. No. 45,300
Int. Cl.³ B01D *46/42, 50/00*
U.S. Cl. 55—310 **10 Claims**

1. In a compressed air system having

a. an air compressor, and

b. equipment using compressed air; wherein the improvement comprises an air drier including:

c. a vessel having

(i) a cylindrical shell with

(ii) two arcuate heads,

(iii) the cylindrical shell having a vertical axis,

d. the height of the vessel being about two and one half times the diameter,

e. a diametrical baffle in the vessel about two-thirds diameter from the top of the vessel,

f. said baffle extending over most of the cross sectional area of the vessel,

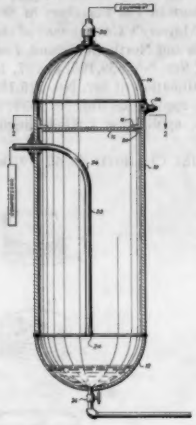
g. a pressure relief valve on the tank above the baffle,

h. an entry pipe entering the vessel below the baffle,

j. the air compressor connected to the entry pipe,

k. the entry pipe terminating with a restricted downward

pointing terminal to assist in the forming of droplets of liquid about one-half diameter from the bottom of the tank,



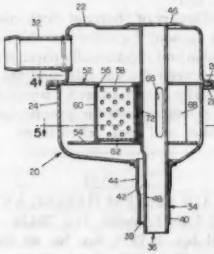
m. a manual drain valve on the bottom of the tank,
n. an outlet connected to the equipment using air, and
o. a filter in the outlet at the top of the tank.

4,234,328

OIL SEPARATOR DEVICE

Sharon J. Hudson, Jr., Toledo, Ohio, assignor to Sharon Manufacturing Company, Toledo, Ohio

Filed Mar. 12, 1979, Ser. No. 19,886
Int. Cl.[3] B01D *45/12*
U.S. Cl. 55—447 **13 Claims**



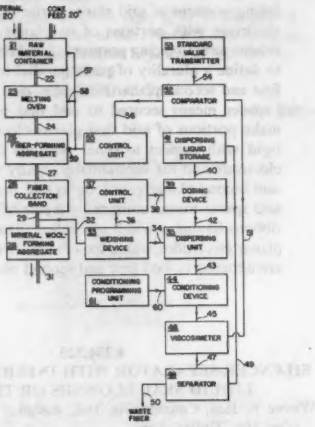
1. A device for separating oil from a stream of oil laden gaseous fumes, said device comprising: a cannister, upper and lower partition members inside said cannister dividing its interior into top, intermediate and bottom chambers, a oil laden fume stream inlet tubular member which extends from below the cannister bottom through all three chambers to the top of the cannister said stream inlet member has an elongated side aperture which opens into said intermediate chamber and extends from adjacent to the upper partition to adjacent to the lower partition, a vane means in said intermediate chamber for directing said stream towards the outer portions of the intermediate chamber away from the center to produce a vortex region in said center, an aperture in the upper partition above the vortex region, an elongated opening in the lower partition adjacent to the cannister sidewall, a tubular oil drain outlet from the bottom chamber and a tubular fume outlet from the top chamber.

4,234,329

METHOD FOR THE PRODUCTION OF MINERAL FIBERS WITH UNITARY FIBER LENGTH CHARACTERISTICS

Gunnar M. T. Söderqvist, and Ulf L. Aberg, both of Sköde, Sweden, assignors to Rockwool Aktiebolaget, Skövde, Sweden

Filed Mar. 1, 1979, Ser. No. 16,382
Claims priority, application Sweden, Mar. 2, 1978, 02388/78
Int. Cl.[3] C03B *37/04, 37/02*
U.S. Cl. 65—2 **31 Claims**



1. In a method of producing mineral fiber in which mineral fiber is produced from a melt under operating conditions which, if changed, cause a change in the length characteristics of fiber being produced, the improvement which comprises:
obtaining a sample of the mineral fiber being produced;
admixing the sample of mineral fiber and a dispersing liquid to form a dispersion of said fiber in the dispersing liquid;
determining the viscosity of said dispersion;
and adjusting at least one of said operating conditions in dependence upon the determined viscosity of said dispersion to cause a change in the length characteristics of the fibers being produced.

4,234,330

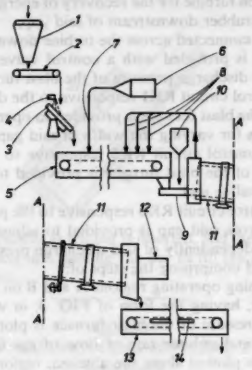
PROCESS OF MAKING CELLULATED GLASS BEADS

Pierre Taupin; Michel Glineur, and Jean Florean, all of Maubeuge, France, assignors to BFG Glassgroup, Paris, France

Continuation of Ser. No. 902,693, May 4, 1978, abandoned. This application Aug. 15, 1979, Ser. No. 66,852
Claims priority, application United Kingdom, May 19, 1977, 21153/77
Int. Cl.[3] C03B *19/10, 19/08*
U.S. Cl. 65—21 **27 Claims**

1. A process of making cellulated glass beads of fully cellulated structure by forming a mixture comprising glass particles and cellulating agent into nodules, heat treating the nodules to cause fusion of glass and evolution of gas from the cellulating agent to form cellulated glass beads, and cooling the cellulated glass beads to a rigid condition, the improvement which comprises the steps of utilizing as the cellulating agent an agent having the characteristic of creating expansion forces due to the evolution of gas during heat treatment which are generated wholly or mainly while the glass viscosity is within the range $10^{6.5}$ to $10^{8.5}$ poises, and carrying out the heat treatment with a quantity of cellulating agent at a maximum cellulation temperature which is not above the temperature corresponding with a glass viscosity of $10^{5.5}$ poises and for a time such that the beads immediately following the heat treatment are populated with cells throughout the volume thereof includ-

ing the exterior surface thereof, and after cooling have a bulk density of not more than 0.5 g/cm^3 and a water-permeability of



less than 15% by volume determined by the immersion test herein specified.

4,234,331

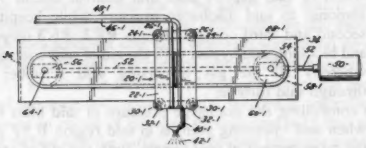
COATING METHOD

Dorian R. Gray, Nashville, Tenn.; Salvatore Guerra, Melvindale, and John H. Meyer, Milford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 935,036, Aug. 18, 1978, abandoned. This application May 29, 1979, Ser. No. 43,552

Int. Cl.^{3} C03C *17/00*

U.S. Cl. 65—60 R **4 Claims**



1. A method of applying a coating to a moving ribbon of glass having a right edge and a left edge, the ribbon of glass having a thickness of about 7/32 inch and being at a temperature in the range of 950° F. to 1150° F., the ribbon of glass moving at a rate of 225 to 325 inches per minute, which method comprises the steps of:

(a) establishing a first spray zone at the right edge of the moving ribbon;

(b) establishing a second spray zone at the left edge of the moving ribbon; said first and said second spray zones being spaced from one another a short distance along the direction of travel of the ribbon of material so that there is no overlap of said spray zones, each of said spray zones applying a spray solution of metal acetylacetonates have the following composition: cobalt—66.5 to 68.5%; iron—18.5 to 20.5%; and chromium—12 to 14% dissolved in a suitable solvent with a solids content of 5 to 20%, the rate of application of said spray solution in each of said spray zones being in a range from 480 cc/min. to 2790 cc/min;

(c) moving said first spray zone from the right edge to the left edge of the moving ribbon while moving said second spray zone from the left edge to the right edge of the moving ribbon as said first spray zone is being moved so that said two spray zones pass one another at a location over the moving ribbon, said spray zones being moved at a rate of 5000 to 10,000 inches per minute;

(d) reversing the direction of movement of said spray zones when they reach the edge of the ribbon towards which they were being moved;

(e) returning said spray zones to the edge of the ribbon at which they started so that said zones once again pass one another at a location over the moving ribbon; and

(f) repeating steps (c), (d) and (e) as the ribbon of material is moved so as to apply a coating to the moving ribbon.

4,234,332

AQUEOUS FERTILIZER SOLUTIONS CONTAINING DICYANDIAMIDE

Horst Michaud, Trostberg; Georg Rieder, Grobenzell, and Josef Seeholzer, Trostberg, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 877,873, Feb. 15, 1978, abandoned, and Ser. No. 870,322, Jan. 18, 1978, abandoned. This application Jan. 23, 1979, Ser. No. 5,791

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702284; Feb. 23, 1977, 2707639

Int. Cl.^{3} C05C *7/00, 9/00*

U.S. Cl. 71—30 **14 Claims**

1. A fertilizer composition which is an aqueous solution of a nitrogen-containing compound selected from urea, ammonium nitrate, ammonia and mixtures thereof and dicyandiamide in an amount such that the dicyandiamide nitrogen is 10% or more by weight of the total nitrogen of said solution.

6. A fertilizer composition consisting essentially of an aqueous solution of at least one commonly used nitrogen-containing fertilizer compound selected from urea, ammonium nitrate, ammonium sulfate and ammonia, said solution having micronutrients dissolved therein and containing a stabilizing amount of dicyandiamide to maintain said micronutrients in solution.

4,234,333

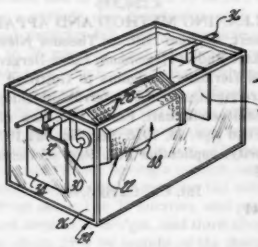
PROCESS FOR RECOVERING METAL CARBIDE POWDER FROM CEMENTED CARBIDES

Mohammad H. Ghandehari, Salt Lake City, Utah, and Mortimer Schussler, Buffalo Grove, Ill., assignors to Fansteel, Inc., North Chicago, Ill.

Filed Apr. 25, 1979, Ser. No. 33,037

Int. Cl.^{2} C22B *23/00*; C25B *1/00*; C25C *1/08*; C25F *3/00*

U.S. Cl. 75—0.5 BA **57 Claims**



1. A process for recovering metal carbide powder from cemented carbide comprising metal carbide grains and a binder phase, such process comprising submerging a plurality of pieces of cemented carbide in a conductive aqueous electrolyte having an anode and a cathode therein, said electrolyte comprising a corrosive agent which in the absence of an applied electrolytic current will corrode and dissolve the binder phase of the cemented carbide pieces while having little if any corrosive effect on the metal carbide grains of such pieces, maintaining at least some of said cemented carbide pieces in contact with said anode, passing an electric current between said anode and cathode, controlling at least one of the amperage and potential of said electric current to electrochemically and

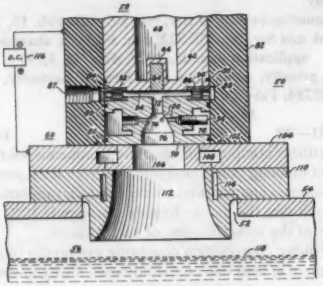
selectively dissolve at least a portion of the binder phase of said cemented carbide pieces without significant dissolution of the metal carbide grains of said cemented carbide pieces, and recovering metal carbide grains from which the binder phase has been dissolved.

4,234,334

ARC CONTROL IN PLASMA ARC REACTORS

Donald R. MacRae, Bethlehem, and Richard G. Gold, Coopersburg, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 10, 1979, Ser. No. 2,288
Int. Cl.³ C22B *5/52, 4/00*
U.S. Cl. 75—10 R **14 Claims**



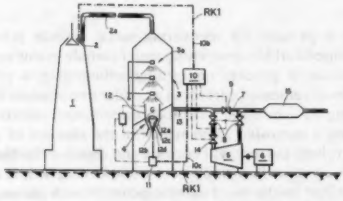
1. A process for controlling the electrical arc in a plasma arc reactor having a first and a second electrode in which a reaction layer covers the first electrode and is a point of arc attachment, which reaction layer is characterized as non-conductive in that the reaction layer at some point during the reaction causes an electrical arc struck between the reaction layer-covered first electrode and the uncovered second electrode to short circuit, which process comprises adding to the reaction layer a material that is more electrically conductive than the reaction layer whereby the arc is stabilized between the uncovered second electrode and the reaction layer-covered first electrode.

4,234,335

GAS CLEANING METHOD AND APPARATUS

Helmut Weissert, Bochum-Hiltrop; Theodor Niess, Mühlheim-Ruhr, and Karl-Rudolf Hegemann, Essen-Bergerhausen, all of Fed. Rep. of Germany, assignors to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserrükkühlanlagen GmbH & Co. Kommanditgesellschaft, Essen, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 901,107
Claims priority, application Fed. Rep. of Germany, May 3, 1977, 2719625
Int. Cl.³ C21B *5/00*
U.S. Cl. 75—41 **2 Claims**



1. A method of operating a gas-cleaning plant in which:
a scrubber having adjustable throttle means downstream of a gas-washing zone, adapted to generate a controllable pressure differential across a gap of variable width, is connected to a gas outlet of a high-pressure blast furnace,
an expansion turbine for the recovery of energy is connected to the scrubber downstream of said gap;
a bypass is connected across the turbine downstream of said gap and is provided with a control valve adjustable to vary the discharge pressure of the blast furnace;
a first control circuit **RK1** responsive to the discharge pressure of the blast furnace is provided to operate said throttle means for varying the width of said gap;
a second control circuit **RK2** responsive to the discharge pressure of the blast furnace is provided to operate said control valve; and
a third control circuit **RK3** responsive to the pressure differential across said gap is provided to adjust said throttle means independently of said discharge pressure;
said method comprising the steps of:
(a) establishing operating regions A and B on a diagram for the plant, having the form of FIG. **3**, in which the discharge pressure of the blast furnace is plotted along the ordinate and volume rate of flow of gas from the blast furnace is plotted along the abscissa, region A being defined between a turbine-insertion characteristic curve TE representing pressures and volumes below which the turbine is ineffective for energy recovery and by a turbine-operating characteristic curve TA representing pressures and volumes beyond which the turbine is no longer able to consume the total gas quantity generated by the blast furnace, region B being defined between said turbine-operating characteristic curve TA and a gas-cleaning characteristic curve GR which parallels a furnace-operating characteristic curve H and is transposed from the latter by said pressure differential;
(b) controlling the discharge pressure of said blast furnace when the plant has an operating point in said region A, with the aid of said throttle means, solely by varying the width of said gap by said first control circuit **RK1** in response to said discharge pressure while keeping said second and third control circuits **RK2**, **RK3** inoperative and blocking said bypass with the aid of said control valve whereby all the gas traversing said scrubber flows through said turbine;
(c) controlling the discharge pressure of said blast furnace when said operating point is in said region B by varying the cross-section of said bypass, with the aid of said control valve, by said second control circuit **RK2** in response to said discharge pressure while keeping said first control circuit **RK1** inoperative and continuing the flow of gas from said scrubber through said turbine; and
(d) while said operating point is in said region B, varying the width of said gap by said third control circuit **RK3** in response to said pressure differential and independently of said discharge pressure;
said first, second and third control circuits **RK1**, **RK2**, **RK3** being selectively activated by a common controller responsive to said discharge pressure and to said volume rate of flow.

4,234,336

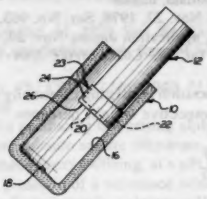
METHOD OF CHARGING A CRUCIBLE

Francis J. Rechin, Chagrin Falls, and Edward J. Vargo, Massillon, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Feb. 15, 1979, Ser. No. 12,318
Int. Cl.³ C22B *23/00*
U.S. Cl. 75—65 R **6 Claims**

1. A method of charging an empty crucible having a refractory wall with a bar of metal, said method comprising the steps of covering only one end portion of the bar with a material which is softer than the material of which the crucible is formed and which has no substantial adverse effect on the chemical composition of the molten metal to be poured from the crucible, inserting the bar into the empty crucible with the one end portion of the bar leading to enable the covering to

engage the inner surface of the empty crucible before molten material is held in the crucible thereby to reduce the extend to which particles of refractory material are dislodged from the



walls of the crucible as the bar is inserted, and then disintegrating the covering and melting the bar to fill the crucible with molten material.

4,234,337

METHOD OF PRODUCING SINTERED FRICTION LAMINAE

Hermann Pütz, Schongau, Fed. Rep. of Germany, assignor to Hoerbiger & Co., Schongau, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 965,995
Claims priority, application Austria, Dec. 2, 1977, 8646/77
Int. Cl.³ B22F *3/00, 5/00*
U.S. Cl. 75—208 R **3 Claims**

1. In a method of producing sintered friction laminae for use in clutches and brakes wherein a metal powder is first scattered over a steel substrate and then is sintered thereon in a sintering furnace which contains a nitrogen-containing protective atmosphere, the improvement wherein said protective atmosphere comprises a continuous stream of ammonium-containing protective gas which flows around said steel substrate with metal powder scattered thereon, wherein the temperature of said sintering furnace is controlled to be above that which causes the ammonia in said protective gas to decompose into nitrogen and hydrogen adjacent said steel substrate with metal powder scattered thereon, and wherein the amount of ammonia in said protective gas and the flow rate of said protective gas around said steel substrate with metal powder thereon is controlled so as to create an excess of nitrogen therearound such that nitrogen will diffuse into the surfaces of the steel substrate and form nitrides, thereby increasing the life and wear resistance of the steel substrate of the formed sintered friction laminae.

4,234,338

THERMAL SHOCK RESISTANCE CERAMIC INSULATOR

Chester S. Morgan, Oak Ridge, and William R. Johnson, Maynardville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1978, Ser. No. 973,846
Int. Cl.³ B22F *1/04*
U.S. Cl. 75—235 **11 Claims**

1. A process for fabricating a cermet exhibiting thermal shock resistance and electrical insulating properties and containing 0.1–20 vol.% metal present as a discontinuous phase, said process comprising the steps of:

(a) providing a first solid phase mixture of a ceramic powder and a metal precursor;

(b) heating said first solid phase mixture above the minimum decomposition temperature of said metal precursor for no longer than about 30 minutes and to a temperature sufficiently above said decomposition temperature to cause the selective decomposition of said metal precursor to said metal to provide a second solid phase mixture of particles of said ceramic powder and discrete metal particles with the latter adhering to the surfaces of said ceramic particles, said metal particles having a mean diameter no more than ½ the mean diameter of said ceramic particles, and

(c) densifying said second solid phase mixture to provide a cermet having 0.1–20 vol.% metal present therein as a discontinuous phase at the boundaries of the ceramic particles.

5. The process of claim 1 wherein the ceramic is Al_2O_3 and the metal precursor is $PtCl_4$ and said heating step (b) is performed to at least 850° C.

8. The cermet prepared by the method of claims 1 or 5.

4,234,339

CORROSION-RESISTANT DENTAL ALLOY

Joseph Aliotta, Newton, Mass., and Louis F. Alcuri, Matawan, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 760,182, Jan. 17, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 936,669
Int. Cl.³ B22F *1/00*
U.S. Cl. 75—255 **8 Claims**

1. A corrosion-resistant dental alloy mixture for use as a filling for dental cavities after amalgamation with mercury, consisting essentially of a substantially uniform mixture of a first corrosion-resistant alloy comprising a mixture of silver, tin and copper, said first alloy being in the form of spherical particles having a mean particle size of from about 20 to 26.5 microns, and further having a particle size distribution such that substantially all of said particles fall within a particle size range of from about 1 to 75 microns, said spherical particles having a surface area of about 0.21 m^2/gm, a second corrosion-resistant alloy comprising a mixture of silver, tin and copper, said second alloy being in the form of randomly shaped particles having a mean particle size of from about 20 to 26.5 microns, and further having a particle size distribution such that substantially all of said particles fall within a particle size range of from about 1 to 75 microns, said randomly shaped particles having a surface area which, exclusive of both spherical particles and flake-like particles as herein defined, ranges from about 0.23 to 0.26 m^2/gm, and a third alloy comprising a mixture of silver, tin and copper, said third alloy comprising flake-like particles having a mean particle size of between about 25 and 30 microns, and further having a particle size distribution such that substantially all of said particles fall within a particle size range of from about 1 to 75 microns, said particles having a surface area of about 0.33 m^2/gm, said third alloy comprising not more than about 25% by weight of the dental alloy mixture.

4,234,340

ANTIFOULING MARINE COATING COMPOSITION CONTAINING AGAR, A PLASTICIZER AND A STRENGTHENING AGENT

Michael A. Pellico, 10753 Palms, Los Angeles, Calif. 90034

Filed May 11, 1979, Ser. No. 38,335
Int. Cl.³ C09D *5/14*
U.S. Cl. 106—15.05 **10 Claims**

1. A marine coating composition comprising from about 8 to about 15 wt.% agar. from about 10 to about 40 wt.% of a polyol plasticizer having at least three carbon atoms and at

least two hydroxyl groups, from about 0.2 to about 2 wt.% of a strengthening agent selected from the group consisting of sodium borate, potassium borate, calcium sulfate, zinc sulfate and mixtures thereof, and water to 100 wt.%.

4,234,341

S-TRIAZINE, PROCESS FOR PRODUCING IT AND ITS USE FOR FIREPROOFING POLYESTER FIBER MATERIALS

Armin Hiestand, Binningen, and Peter Rohringer, Schönenbuch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 808,009, Jun. 20, 1977, Pat. No. 4,165,435. This application Apr. 18, 1979, Ser. No. 31,237

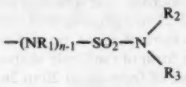
Claims priority, application Switzerland, Jun. 25, 1976, 8156/76

Int. Cl.[2] **B32B** *27/36;* **B05D** *3/02;* **C09D** *5/18;* **C09K** *3/28*

U.S. Cl. 106—18.22 **3 Claims**

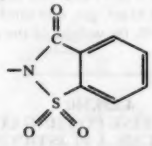
1. A process for fireproofing fiber materials made from polyester, which process comprises treating these materials with a preparation containing a s-triazine of the formula

wherein X is a radical of the formula



(1.1)

wherein n is 1 or 2, R_1 is phenyl substituted by methyl, ethyl, sulphonamido or carboxylamido, or unsubstituted phenyl or hydrogen, R_2 and R_3 each have the meanings given for R_1 or are benzyl, phenylethyl, cyclohexyl, or alkyl with 1 to 4 carbon atoms and which is unsubstituted or substituted by hydroxyl, methoxy or ethoxy, or R_2 and R_3 together are alkylene having 4 to 5 carbon atoms or ethyleneoxyethylene, or X is a radical of the formula



(1.2),

and Y and Z each have the meanings given for X or are alkylamino or dialkylamino with 1 to 4 carbon atoms per alkyl group, and, if n is the formula (1.1) is 2, Y and Z also are alkoxy with 1 to 8 carbon atoms, phenoxy alkylphenoxy with 1 to 4 carbon atoms in the alkyl group, benzyloxy, halogen or hydroxyl, and subjecting the materials treated in this manner to a heat treatment.

4,234,342

GLASS COMPOSITION

Isao Wakasa; Shuichi Yamazaki, both of Fukushima, and Hideo Taguchi, Nihonmatsu, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Nov. 22, 1978, Ser. No. 963,164

Claims priority, application Japan, Nov. 30, 1977, 52-143725

Int. Cl.[3] **C03C** *13/00, 3/04*

U.S. Cl. 106—50 **3 Claims**

1. A glass composition consisting essentially of the following compounds and respective weight percents:

SiO_2: 55.5–58.0
ZrO_2: 13.5–15.5
Na_2O: 13.0–14.5
MnO: 7.0–10.5
CaO: 3.0–6.5

wherein the total weight of MnO and CaO equals or exceeds 11% by weight and the weight of MnO equals or exceeds the weight of CaO.

4,234,343

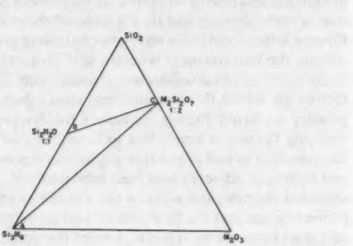
STRUCTURAL SILICON NITRIDE MATERIALS CONTAINING RARE EARTH OXIDES

Clarence A. Andersson, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 4, 1979, Ser. No. 1,033

Int. Cl.[3] **C04B** *35/50, 35/58*

U.S. Cl. 106—73.2 **7 Claims**



1. A ceramic composition suitable for use as a high-temperature structural material, said composition being within the triangular area defined by the points ABCA of the Si_3N_4-SiO_2-M_2O_3 ternary diagram depicted in FIG. 1, M being selected from the group consisting of alloys having Yb, Y, Er, or Dy as a first component and Sc, Al, Cr, Ti, (Mg+Zr) or (Ni+Zr) as a second component, said alloy having an effective ionic radius less than 0.89 A.

4,234,344

LIGHTWEIGHT CEMENT AND METHOD OF CEMENTING THEREWITH

John M. Tinsley, and Larry T. Watters, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 18, 1979, Ser. No. 40,254

Int. Cl.[3] **C04B** *7/02*

U.S. Cl. 106—88 **38 Claims**

1. In a process for cementing a bore hole intersecting a subterranean formation in which the cementing composition may be at an elevated temperature using an aqueous hydraulic cement slurry, the improvement of adding to the cement slurry to decrease its thermal conductivity, to decrease its density and to provide high strength at the elevated temperature, the components comprising a fine particulate crystalline silica having a particle size of less than about 10 mesh and a lightweight inorganic material which does not absorb a substantial quantity of water and which lowers the density of said slurry to about 8.5–13.0 pounds/gallon under well cementing conditions.

4,234,345

METHOD FOR PRODUCING HARD PLASTER OF PARIS

Fritz Fässle, Limburgerhof, Fed. Rep. of Germany, assignor to Guilini Chemie GmbH, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Oct. 11, 1979, Ser. No. 83,834

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1978, 2844266

Int. Cl.[3] C01F *11/46;* C04B *11/00*

U.S. Cl. 106—110 15 Claims

1. A method for producing fast-setting alpha calcium sulfate hemihydrate from calcium sulfate dihydrate, comprising:

(a) hydrothermally recrystallizing, at a pH less than or equal to 3, in the presence of a substance which influences the tendency to form crystals, calcium sulfate dihydrate, to form a mixture comprising 95% to 99% by weight of alpha calcium sulfate hemihydrate having an axial ratio of 1:8 to 1:12, and 1% to 5% calcium sulfate dihydrate;

(b) treating the mixture by drying said hemihydrate and calcining the dihydrate to form beta calcium sulfate hemihydrate while leaving a remainder of dihydrate, said calcining leaving no more than 0.5% by weight of the total calcium sulfate in dihydrate form; and

(c) grinding the treated mixture to an average grain size of 10μ to 20μ.

13. Hard plaster of paris grain comprising 95% to 99% by weight alpha calcium sulfate hemihydrate, 0.5% to 4.5% by weight beta calcium sulfate hemihydrate, and calcium sulfate dihydrate, the calcium sulfate dihydrate being present in a maximum of 0.5% by weight calcium sulfate dihydrate, the hard plaster of paris having an average grain size of 10μ to 20μ.

4,234,346

HIGH STRENGTH MODIFIED ASPHALT PAVING COMPOSITION

Laurence Latta, Jr., Portola Valley, and John B. Leonard, Jr., Hillsborough, both of Calif., assignors to Chem-Crete Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 780,862, Mar. 24, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,293

Int. Cl.[2] C08L *95/00*

U.S. Cl. 106—281 R 19 Claims

1. A paving composition comprising at least 85 percent by weight aggregate, substantially unblown and unoxidized asphalt cement which is neither cut-back nor emulsified and which has bitumens as its predominant constitutent, and a strength improving agent comprising an organic manganese compound, either alone or in combination with organic-cobalt or organic-copper compounds, said strength improving agent being present in a form sufficient to make it substantially soluble in said asphalt cement and in an amount sufficient to provide manganese, manganese and cobalt or manganese and copper ion concentrations, based upon the total weight of said ions, in the range of about 0.01 to 0.50 percent by weight of said asphalt cement.

4,234,347

BINDER FOR CHEMICALLY RESISTANT CONCRETE AND PROCESS FOR PRODUCING THIS BINDER

Vsevolod P. Kirilishin, ulitsa Zhanny Leburb, 6, kv. 4, Odessa, U.S.S.R.

Filed Aug. 30, 1979, Ser. No. 71,056

Int. Cl.[3] C09K *3/00*

U.S. Cl. 106—286.7 17 Claims

1. A binder for a chemically resistant concrete, comprising from 30 to 80% by weight of a finely divided quartz sand having a specific surface area of from 1000 to 5000 cm^2/g and from 20 to 70% by weight of at least one crystalline modification of silica selected from the group consisting of tridymite and cristobalite and containing on the surface of its particles from 0.5 to 6 mol percent at least one R_2O oxides, wherein R is sodium or potassium.

4,234,348

PROCESS FOR THE PRODUCTION OF IRON OXIDE RED PIGMENTS

Horst Brunn; Heribert Bade, and Franz Hund, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 22, 1979, Ser. No. 41,466

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1978, 2826941

Int. Cl.[3] C09C *1/24*

U.S. Cl. 106—304 5 Claims

1. In the production of an iron oxide red pigment by reducing nitrobenzene with metallic iron in the presence of an acidic iron (II) salt solution, separating off the iron oxide pigment obtained from the reaction medium by washing out, and calcining the pigment at a temperature in the range of about 600° to 1100° C., the improvement which comprises adding an aluminum salt solution over a period of about 5 to 360 minutes at a temperature of about 20° to 100° C. to the iron oxide suspension accumulating during reduction of the nitrobenzene, the suspension containing about 150 to 500 g of iron/l and a residual iron (II) chloride content of about 20 to 160 g/l expressed as iron, the initial pH-value of the iron oxide suspension of about 3 to 5 being adjusted over a period of about 5 to 180 minutes to a final pH-value of about 5.5 to 6.5.

4,234,349

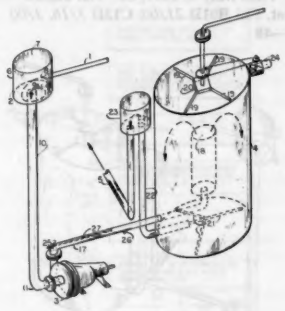
APPARATUS FOR THE PURIFICATION OF EVAPORATED SUGAR SOLUTIONS

Norland L. C. Suzor, Paauhau, Hi., assignor to Davies Hamakua Sugar Co., a division of Theo. H. Davies, Ltd., Paauilo, Hi.

Filed Apr. 16, 1979, Ser. No. 30,169

Int. Cl.[3] C13D *3/16;* B01D *21/00*

U.S. Cl. 127—12 8 Claims



1. Apparatus for separating minute hydrophobic particles of non-sugars from an evaporated sugar solution containing such particles in an in-line continuous process which comprises in combination:

a. a first tank;

b. a first inlet means operably connecting the inside of said first tank to the atmosphere so as to admit air into said first tank;

c. an outlet means centrally located in the bottom of said first tank;

d. a vertical standpipe operably connected below said first tank to said outlet means;

e. a second inlet means operably connecting the interior of said first tank with a source of said solution containing minute hydrophobic non-sugar particles so as to direct said liquid into a revolving path about and into the outlet of said first tank and down said standpipe thus forming a vortex at the outlet of said first tank drawing air into said vortex formed in said revolving body of solution;

f. a semi-open impeller centrifugal pump having an inlet and

an outlet means and being of the type having the impeller mounted on the end of a drive shaft with the blade side of the impeller being opposite to and centered on the inlet means, the central portion of said impeller when shaft-mounted being substantially flat so as to not interfere with the formation of a vortex in the eye of the impeller, the blades of which impeller being substantially straight and radial;

g. drive means operably connected to said drive shaft so as to rotate said impeller at a blade tip speed of about 100 feet per second or more;

h. means operably connecting said standpipe to the inlet means of said pump whereby said solution containing air having passed through said standpipe will enter said pump through said inlet means whereby said impeller when turning at high speed will reduce the basic particle size, break up any agglomerates of particles and break the air into micron size bubbles, thoroughly mixing the air, solution and particles so that the particles will leave the solution and cling to the bubbles; and

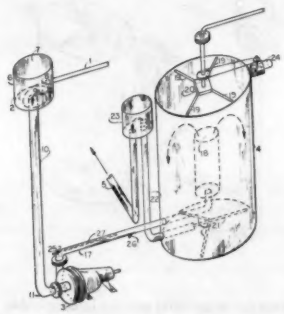
i. separation means operably connected to said outlet means of said pump whereby hydrophobic particles of non-sugars clinging to air bubbles are separated from the evaporated sugar solution.

4,234,350

PROCESS FOR THE PURIFICATION OF EVAPORATED SUGAR SOLUTIONS

Norland L. C. Suzor, Paauhau, Hi., assignor to Davies Hamakua Sugar Co., a division of Theo. H. Davies, Ltd., Paauilo, Hi.

Filed May 7, 1979, Ser. No. 36,834
Int. Cl.[2] B01D *21/00*; C13D *3/16, 3/00*
U.S. Cl. 127—48 **11 Claims**



1. An in-line continuous process for the purification of an evaporated non-sugar particle containing sugar solution without using chemical additives prior to introducing air therein which comprises the steps of:

a. introducing air into said solution to form a mixture of air and said solution;

b. transforming the mixture into a creamy liquor having non-sugar particles appregated to minute interspersed air bubbles;

c. separating the aggregated non-sugar particles and bubbles from the transformed mixture; and

d. recovering as product the sugar solution so separated from the aggregated non-sugar particles.

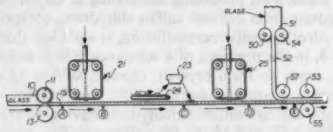
4. A process as claimed in claim **1** also consisting of an additional step of adding an anionic partially hydrolized polyacrylamide at a low controlled rate following step b and before step c.

4,234,351

PROCESS FOR FABRICATING GLASS-ENCAPSULATED SOLAR CELL ARRAYS AND THE PRODUCT PRODUCED THEREBY

Czeslaw Deminet, Kent, and Richard E. Oettel, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 14, 1978, Ser. No. 924,733
Int. Cl.[2] H01L *31/04, 31/18*
U.S. Cl. 136—251 **12 Claims**



7. The product formed by a process for fabricating solar cell arrays which comprises the steps of:

a. forming a base layer of glass;

b. forming a pattern of indentations bounded by ridges in said base layer;

c. forming an electrically conducting first connecting element on said base layer, wherein said first connecting element extends from a given indentation to a point on an adjacent ridge;

d. positioning a solar cell in said given indentation so that the lower surface of said solar cell is in electrical contact with the one end of said first connecting element in said given indentation;

e. forming an electrically conducting second connecting element to extend between the other end of said first connecting element on said adjacent ridge and the top surface of a solar cell in an adjacent indentation; and

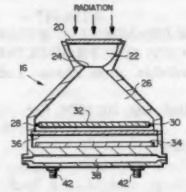
f. forming a top layer of glass on the product of steps a–e above by heating glass sufficiently until it flows, applying the flowing gas to the upper surface of the product of steps a–e above so that it fills in the irregularities thereof, and applying sufficient pressure to create an intermolecular bond between said top layer of glass and the exposed portions of the glass base layer, the solar cells and the connecting elements, the application of pressure being sufficiently time-limited to prevent migration of the PN junction in the solar cell.

4,234,352

THERMOPHOTOVOLTAIC CONVERTER AND CELL FOR USE THEREIN

Richard M. Swanson, Los Altos, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto and Stanford University, Stanford, both of, Calif.

Filed Jul. 26, 1978, Ser. No. 928,103
Int. Cl.[3] H01L *31/06*
U.S. Cl. 136—253 **17 Claims**



1. A thermophotovoltaic conversion system comprising:

(a) means for collecting and concentrating solar radiation,

(b) means for receiving said concentrated solar radiation and re-radiating energy and including a housing having a radiation receiving window, a chamber for confining said

concentrated radiation, and a radiator element within said chamber for receiving said concentrated radiation and re-radiating energy, and

(c) a photovoltaic cell for receiving said re-radiated energy and generating an electrical voltage, said cell including a monocrystalline semiconductor substrate having first and second opposing surfaces, said substrate being positioned with respect to said means for re-radiating energy whereby said re-radiated energy is received by said first surface, a first plurality of rows of doped regions of a first conductivity type in said second surface, a second plurality of rows of doped regions of a second conductivity type in said second surface, said first plurality of rows being interleaved with said second plurality of rows, each of said rows comprising a plurality of spaced apart doped regions occupying a minimal area of said second surface, first optically reflective conductive means electrically interconnecting said first plurality of rows of doped regions, a reflection enhancement layer provided between said first conductive means and said second surface except at said first plurality of doped regions, and second conductive means electrically interconnecting said second plurality of rows of doped regions whereby said electrical voltage is generated between said first and second conductive means.

4,234,353

PROCESS FOR PREPARING PHOTOVOLTAIC CELLS HAVING INCREASED ADHESION OF THE SEMI-CONDUCTING LAYER AND PRODUCED THEREBY TO THE CONDUCTING LAYER

Lee F. Donaghey, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 887,081, Mar. 16, 1978, abandoned. This application Apr. 9, 1979, Ser. No. 27,979

Int. Cl.[2] H01L *31/06;* **B05D** *5/12*

U.S. Cl. 136—258 **7 Claims**

1. In a process for preparing a thin film polycrystalline photovoltaic cell which comprises deposition of a semi-conducting layer on a conducting electrode layer, the improvement which comprises increasing the adhesion of the semi-conducting layer to the conducting layer by incorporating from about 0.01 to about 0.0001 mol of the element or elements of the conducting layer per mol of metallic or major component in the semi-conducting layer.

6. An improved cadmium sulfide photovoltaic cell comprising a thin film polycrystalline cadmium sulfide semi-conducting layer on a conducting electrode layer wherein the cadmium sulfide semi-conducting layer comprises from about 0.01 to about 0.0001 mol of the element or elements of the conducting layer per mol of metallic or major component of the semi-conducting layer.

4,234,354

SOLAR POWER UNIT

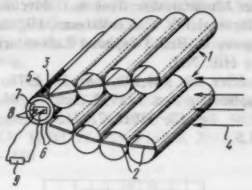
Nikolai S. Lidorenko, 3 Mytischinskaya ulitsa, 14a, kv. 127; Tatyana A. Litsenko, ulitsa Trubnaya, 11, kv. 12; Valery N. Potapov, ulitsa Timiryazevskaya, 13, kv. 213; Stanislav V. Ryabikov, pereulok Vasnetsova, 12, kv. 64, and Dmitry S. Strebkov, Kirovogradsky proezd, 3, korpus 1, kv. 17, all of Moscow, U.S.S.R.

Filed Apr. 20, 1979, Ser. No. 31,983

Int. Cl.[3] H01L *31/04;* **F24J** *3/02*

U.S. Cl. 136—246 **4 Claims**

1. A solar power unit comprising: a solar energy collector in the form of a mirror reflector assembly, said mirror reflector assembly including a plurality of flat mirror facets, each of said mirror facets being enclosed within a respective one of a plurality of hermetically sealed convexly shaped shells formed of a material which is transparent to radiation, and wherein each of said shells is filled with a reducing agent in intimate contact with said mirror facet enclosed therewithin; and a solar energy



receiver; said receiver adapted to be exposed to a radiation flux reflected by said collector.

4,234,355

METHOD FOR MANUFACTURING A SEMICONDUCTOR ELEMENT UTILIZING THERMAL NEUTRON IRRADIATION AND ANNEALING

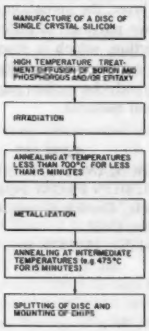
Horst Meinders, Reutlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,039

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755418

Int. Cl.[2] H01L *21/263*

U.S. Cl. 148—1.5 **14 Claims**


MANUFACTURE OF A DISC OF SINGLE CRYSTAL SILICON
HIGH TEMPERATURE TREATMENT DIFFUSION OF BORON AND PHOSPHORUS AND/OR EPITAXY
IRRADIATION
ANNEALING AT TEMPERATURES LESS THAN 700°C FOR LESS THAN 15 MINUTES
METALLIZATION
ANNEALING AT INTERMEDIATE TEMPERATURES (e.g. 475°C FOR 15 MINUTES)
SPLITTING OF DISC AND MOUNTING OF CHIPS

1. In a method for manufacturing a semiconductor element from a single crystal semiconductor body having a crystal lattice and at least one surface, said method comprising the steps of

subjecting said single crystal semiconductor body to at least one high temperature process for creating a pn junction;

then irradiating said semiconductor body with thermal neutrons at a rate of $2 \cdot 10^{11}$ neutrons/cm^2-s for about 15 hours to create homogeneously distributed recombination centers;

then applying a metallization to said semiconductor body to constitute an electrode;

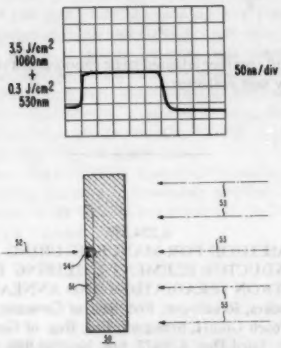
and then subjecting said semiconductor body with said metallization to an annealing process at an intermediate temperature between 180° and 600° C. for joining said metallization to said surface of said semiconductor body;

said step of subjecting said semiconductor body to said annealing process also partially healing said lattice dislocations.

4,234,356
DUAL WAVELENGTH OPTICAL ANNEALING OF MATERIALS

David H. Auston, Mountainside; Jene A. Golovchenko, Basking Ridge, and Thirumalai N. C. Venkatesan, Highland Park, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 964,193, Nov. 28, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,663
Int. Cl.[2] H01L *21/263*
U.S. Cl. 148—1.5 19 Claims

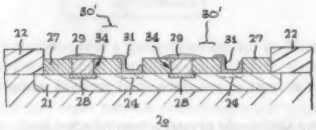


1. A process for annealing damaged material comprising exposing a damaged layer, overlying a single crystal material, to light thereby rendering the damaged region and at least a portion of the underlying material molten, and thereby annealing the damaged layer, the invention characterized in that the light comprises two portions, of different wavelengths, a first melt-initiating portion, which is absorbed by the solid layer rendering at least a portion of it molten, and a second drive in portion which extends the molten region to at least the depth of the single crystal material.

4,234,357
PROCESS FOR MANUFACTURING EMITTERS BY DIFFUSION FROM POLYSILICON

James E. Scheppele, Garden Grove, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed Jul. 16, 1979, Ser. No. 57,694
Int. Cl.[3] H01L *7/00*
U.S. Cl. 148—1.5 12 Claims

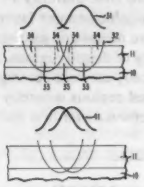


1. A process for forming a semiconductive electronic translation device comprising the steps of:
forming a base region on a semiconductive silicon wafer;
depositing a polysilicon layer over said base region;
forming a protective covering on said polysilicon layer directly over selected closely spaced sites of said base regions, said sites including plural sites for making an electrical contact with said base region and plural emitter sites;
replacing the polysilicon not under said protective covering with silicon dioxide;
removing the polysilicon over said base contact sites to expose portions of the base region; and
diffusing a conductivity-determining impurity previously placed in the polysilicon overlaying said emitter sites into said base region to form emitter regions within said base region.

4,234,358
PATTERNED EPITAXIAL REGROWTH USING OVERLAPPING PULSED IRRADIATION

George K. Celler, Lawrenceville; Lionel C. Kimerling, Westfield; Harry J. Leamy, New Providence; John M. Poate, Summit, and George A. Rozgonyi, Chatham, all of N.J., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1979, Ser. No. 27,274
Int. Cl.[3] H01L *21/268, 21/26*
U.S. Cl. 148—1.5 23 Claims

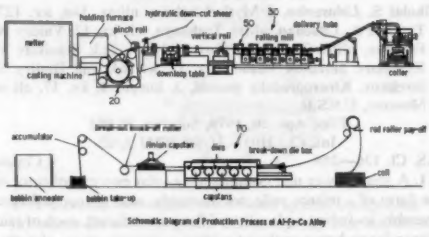


1. A method comprising
irradiating a first region of material, which adjoins a single crystal material, with a pulse of energy which is absorbed at least in part by the material; and
irradiating subsequently a second region of material adjacent to the first region; the invention characterized in that the irradiated regions overlap each other sufficiently, and the energy of the irradiating pulse and the absorptivity of the irradiated material are of such values that each region of the material which is irradiated is seeded by adjacent single crystal material and is epitaxially regrown to an essentially single crystal structure, thereby defining an essentially continuous single crystal pattern.

4,234,359
METHOD FOR MANUFACTURING AN ALUMINUM ALLOY ELECTRICAL CONDUCTOR

Enrique C. Chia, and Roger J. Schoerner, both of Carroll County, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 632,982, Nov. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 430,300, Jan. 2, 1974, Pat. No. 3,920,411, which is a continuation of Ser. No. 199,729, Nov. 17, 1971, abandoned, which is a division of Ser. No. 54,563, Jul. 13, 1970, abandoned. This application Jan. 19, 1978, Ser. No. 870,651
Int. Cl.[3] C22F *1/04*
U.S. Cl. 148—2 13 Claims



Schematic Diagram of Production Process of Al-Fe-Co Alloy

1. Method of manufacturing an aluminum alloy electrical conductor having a minimum conductivity of 58% IACS, a

minimum yield strength of 12,000 PSI, and a minimum ultimate tensile strength of 18,000 PSI, comprising:

(a) alloying a minimum of 93.5% by weight molten aluminum, having normal trace impurities associated therewith, with from about 0.4 to about 6.5 percent by weight total at least one additional alloying element selected from the group consisting essentially of cobalt, iron and other elements capable of yielding intermetallic precipitates during subsequent thermomechanical processing without reducing the conductivity of the conductor below said 58% IACS;

(b) rapidly casting the melt into a bar having an as-cast structure of pure aluminum dendrites with an interdendritic eutectic network consisting of an aluminum matrix and intermetallic precipitates of aluminum and said at least one alloying element;

(c) hot-working said cast bar, in the as-cast condition, into rod in a series of deformations to reduce the cross-sectional area thereof and convert the aluminum matrix into a fine subgrain structure; and

(d) wherein said step of hot-working includes increasing the dislocation density in the matrix during the first of said series of deformations sufficiently to form a substantially well-defined subgrain structure therein, thereby maximizing a refinement of said subgrain structure by permitting breaking-up thereof in each of the subsequent deformations.

4,234,360

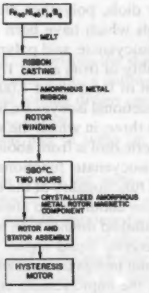
METHOD OF MAKING HYSTERESIS MOTOR ROTOR USING AMORPHOUS MAGNETIC ALLOY RIBBONS

Peter G. Frischmann, Scotia; Fred E. Luborsky, Schenectady, and Russell E. Tompkins, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 21, 1978, Ser. No. 898,919

Int. Cl.[3] **C21D** *1/04;* **H01F** *1/00;* **C22B** *43/00*

U.S. Cl. 148—121 **5 Claims**



1. The method of making a hysteresis motor rotor assembly having a predetermined hysteresis loop area, which comprises the steps of

casting a magnetic alloy composition in the form of a ductile amorphous metal ribbon having a value of coercive force in the range of from about 0.01 to about 0.1 oersted,

tightly winding said ductile ribbon on a rotor member,

affixing the wound ribbon to said rotor member to form a rotor assembly,

preselecting a value of coercive force in the range of from about 10 to about 300 oersteds to be provided to said wound ribbon,

heating said rotor assembly to a preselected temperature above the crystallization temperature for said magnetic alloy composition, and

maintaining said rotor assembly at said preselected temperature for a period of time at least sufficient to develop said preselected coercive force in said wound ribbon.

4,234,361

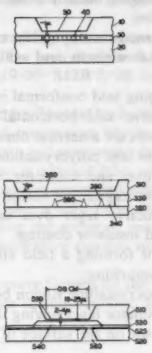
PROCESS FOR PRODUCING AN ELECTROSTATICALLY DEFORMABLE THIN SILICON MEMBRANES UTILIZING A TWO-STAGE DIFFUSION STEP TO FORM AN ETCHANT RESISTANT LAYER

Henry Guckel, Madison, Wis., and Steven T. Larsen, Albany, Oreg., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 944,637, Sep. 21, 1978, which is a continuation of Ser. No. 739,583, Nov. 8, 1976, abandoned. This application Jul. 5, 1979, Ser. No. 54,815

Int. Cl.[3] **H01L** *21/223, 21/225, 21/306, 29/06*

U.S. Cl. 148—186 **10 Claims**



1. A process for producing mechanically stable thin membranes in a crystalline silicon substrate suitable for incorporation in integrated circuits, comprising the steps of:

(a) diffusing boron into one of the opposite sides of a silicon substrate in a deposition furnace for a period of time not greater than approximately 90 minutes, with the boron being supplied in an amount sufficient and at a temperature sufficient to form a layer in the silicon substrate having boron atom concentrations greater than 10^{21} per cubic centimeter;

(b) transferring the diffused silicon substrate from the deposition furnace to a drive furnace while substantially excluding absorption of water vapor by the silicon substrate;

(c) heating the substrate in the drive furnace in an ambient gas which is substantially oxygen and water vapor free for a selected period of time at a temperature sufficient to drive the diffused boron to a desired depth in the silicon substrate;

(d) masking the side of the substrate opposite to the boron diffused layer to expose a selected area of silicon at a portion of the surface having selected lateral dimensions; and

(e) applying a silicon etchant to the exposed unmasked surface area until sufficient silicon is dissolved to expose the diffused boron layer and be retarded from further etching thereby, the exposed portion of the etchant resistant layer thereby forming a thin membrane.

4,234,362

METHOD FOR FORMING AN INSULATOR BETWEEN LAYERS OF CONDUCTIVE MATERIAL

Jacob Riseman, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,606

Int. Cl.[3] **H01L** *21/22, 21/306*

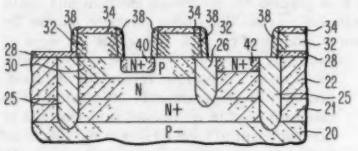
U.S. Cl. 148—187 **23 Claims**

8. A method for forming bipolar integrated circuit devices having an insulator between conducting layers comprising:

providing a silicon body having a pattern of monocrystalline silicon regions isolated from one another;

forming a base region in said monocrystalline regions;
providing an insulator over the surface of said body having said pattern with openings for the base contacts to said base regions;
depositing a layer of polycrystalline silicon over said insulator and said openings therein;
forming an insulator coating upon said polycrystalline silicon layer;
removing said insulator coating and said polycrystalline silicon layer from where said emitter and collector reach-through are to be formed which results in regions of said polycrystalline layer with said insulator coating thereon having substantially horizontal surfaces and substantially vertical surfaces;
forming a conformal insulating layer on both said substantially horizontal surfaces and said substantially vertical surfaces;
reactive ion etching said conformal insulating layer to substantially remove said horizontal conformal insulating layer and to provide a narrow dimensioned vertical insulating region on said polycrystalline layer;
forming the emitter and collector reach-through regions within said monocrystalline silicon regions; and
forming a conductive layer over said vertical insulating region and said insulator coating.

16. A method for forming a field effect device integrated circuit structure comprising:
providing a monocrystalline silicon body;
forming a first insulator layer having the desired thickness of the gate insulator on the surface of said body;



forming a first polycrystalline silicon layer over said insulator layer;
forming a second insulator layer on the surface of said first polycrystalline silicon layer;
removing said second insulator layer and said first polycrystalline silicon layer from portions of said first insulator layer to form part of the gate electrode and which results in regions of said polycrystalline layer with said second insulator layer thereon having substantially horizontal surfaces and substantially vertical surfaces;
forming a conformal insulating layer on both said substantially horizontal surfaces and said substantially vertical surfaces;
reactive ion etching said conformal insulating layer to substantially remove said horizontal conformal insulating layer and to provide a narrow dimensioned vertical insulating region on said polycrystalline layer;
forming a second polycrystalline silicon layer over said vertical insulating region, said exposed first insulator layer and said second insulator layer;
forming a third insulator layer on said second polycrystalline layer;
removing said third insulator layer and said second polycrystalline layer in the desired pattern to connect the said field effect devices in said integrated circuit;
removing said second insulator layer and said first polycrystalline layer in the areas where diffused regions are required for said field effect devices and to fully define the said gate electrode pattern; and
forming said diffused regions.

4,234,363

SOLID PROPELLANT HYDROGEN GENERATOR

Joseph E. Flanagan, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 371,928, Jun. 11, 1973, abandoned. This application Jul. 2, 1975, Ser. No. 593,599
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.4 **5 Claims**

1. A solid propellant hydrogen generator comprising:
an oxidizer selected from the group consisting of triaminoguanidine nitrate, diazidodinitrazahexane, diazidotrinitrazaheptane, ammonium nitrate, and cyclotetramethylene tetranitramine;
a fuel selected from the group consisting of triaminoguanidine-5-amino tetrazole and the double salt of triaminoguanidine and azotetrazole;
and a binder selected from the group consisting of polyesters, polyethers and polybutadiene;
said oxidizer, fuel and binder being formulated to maximize hydrogen exhaust components while maintaining the oxygen to carbon stoichiometry at about 1/1 and providing flame temperatures above 1200° K.

4,234,364

CROSSLINKED DOUBLE BASE PROPELLANT BINDERS

Anderson E. Robinson, Jr., Destin, Fla., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 30, 1978, Ser. No. 910,792
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.4 **9 Claims**

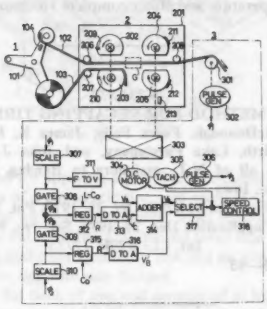
1. A crosslinked binder suitable as the binder portion of a crosslinked double base propellant composition in which the crosslinked binder is a urethane rubber comprising the reaction product of:
(a) nitrocellulose having a nitrogen content of from about 11.0% to 13.4%, an intrinsic viscosity of at least about 0.55 dl./gram to about 2.0 dl./gram.;
(b) a polymeric diol selected from the group consisting of polyester diols, polyether diols and polyester and polyether diols which have been chain extended by reaction with a diisocyanate, said polymeric diol having a hydroxyl functionality of from about 1.9 to about 2.1 and a molecular weight of from about 1,000 to 10,000; and
(c) a polyfunctional isocyanate having an NCO functionality of at least three; in which the weight ratio of nitrocellulose to polymeric diol is from about 0.15 to about 0.001 and the ratio of isocyanate functional groups to the combined hydroxyl functionality of the nitrocellulose and polymeric diol is from about 1/1 to about 1.5/1.

7. In a crosslinked double base propellant composition comprising an energetic liquid nitrate ester plasticizer, nitrocellulose, organic and inorganic oxidizing agents, fuels, and a crosslinked binder, the improvement comprising as the crosslinked binder a urethane rubber comprising the reaction product of:
(a) nitrocellulose having a nitrogen content of from about 11.0% to 13.4%, and an intrinsic viscosity of at least about 0.55 dl./gram to about 2.0 dl./gram.;
(b) a polymeric diol selected from the group consisting of polyester diols, polyether diols and polyester and polyether diols which have been reacted with a diisocyanate, said polymeric diol having a hydroxyl functionality of from about 1.9 to about 2.1 and a molecular weight of from about 1,000 to 10,000; and
(c) a polyisocyanate having an NCO functionality of at least three;
in which the weight ratio of nitrocellulose to polymeric diol is from about 0.15 to about 0.001 and the ratio of isocyanate functional groups to the combined hydroxyl functionality of the nitrocellulose and polymeric diol is from about 1/1 to about 1.5/1 and in which the weight ratio of said plasticizer to binder is from about 2/1 to less than about 4.5/1.

4,234,365
WEB BUTT-JOINING SYSTEM

Shigehisa Shimizu; Sanshiro Fukuhara, both of Minami-ashigara; Noboru Shinmura, and Hisahiro Tanigawa, both of Yokohama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 28, 1978, Ser. No. 974,273
Claims priority, application Japan, Dec. 28, 1977, 52/157360
Int. Cl.[2] B26D *5/00*
U.S. Cl. 156—64 19 Claims



1. A method of butt-joining comprising the steps of:

feeding a pair of webs to be joined into a cutting and joining section having cutting and joining drums operable by the selective driving of a D.C. motor,

overlapping and cutting said pair of webs on said cutting drums,

butting and joining the ends of said cut webs,

controlling the rotational speed of said D.C. motor during said cutting and joining steps in response to a signal indicating both the web running speed and the relative positions between the drums and webs such that the running speed of said webs corresponds to the circumferential speed of said cutting and joining drums during the cutting and joining steps, and

stopping said cutting and joining drums at predetermined positions following completion of the cutting and joining steps.

9. A web butt-joining system comprising:

a feeding section having rolls for feeding a pair of new and old webs, a cutting and joining section having cutting drums and joining drums, a drive control section having a driving D.C. motor commonly coupled to said cutting drums and joining drums and a calculation control circuit for selectively controlling said driving D.C. motor in response to signals indicative of both the running speed of said old web and the positional relationship between said old web and said cutting and joining drums, said drive control section being operated to cut said new and old webs fed from said feeding section with said cutting drums and to butt-join the ends of said webs thus cut with bonding tapes provided on said joining drums.

4,234,366
WALL AND FLOOR COVERINGS COMPRISING A SUBSTRATE FORMED FROM COMMINUTED, RECYCLED, FIBER-REINFORCED FOAM-CONTAINING SHEETS

Douglas M. Brewer, Dundee; Alan Mawson, Fife, and William S. Carter, Kirkcaldy, all of Scotland, assignors to Nairn Floors Limited, Lune Mills, England

Continuation-in-part of Ser. No. 761,195, Jan. 21, 1977, Pat. No. 4,122,224, which is a continuation-in-part of Ser. No. 639,519, Dec. 10, 1975, abandoned. This application Sep. 1, 1978, Ser. No. 940,791
Claims priority, application United Kingdom, Dec. 12, 1974, 53709/74
The portion of the term of this patent subsequent to Oct. 24, 1995, has been disclaimed.
Int. Cl.[2] B29H *19/00;* B32B *5/18, 5/20, 25/08*
U.S. Cl. 156—79 14 Claims

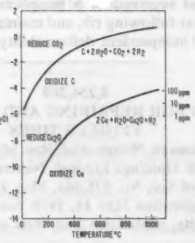
1. A method of making a floor or wall covering comprising making a sheet material comprising fibrous reinforcement, a layer of foamed vinyl resin and pigmented decoration, wherein the fibrous reinforcement is selected from reinforcing fibres in the foamed layer and fibrous support beneath the foamed layer, comminuting this sheet into a mass of particles, softening the mass of particles, forming the softened mass into a substrate sheet and bonding a decorative opaque surface layer to the sheet.

11. Floor or wall covering formed by the method of claim 1 comprising a decorative opaque surface layer bonded to a substrate sheet.

4,234,367
METHOD OF MAKING MULTILAYERED GLASS-CERAMIC STRUCTURES HAVING AN INTERNAL DISTRIBUTION OF COPPER-BASED CONDUCTORS

Lester W. Herron, Hopewell Junction; Raj N. Master, and Rao R. Tummala, both of Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 23, 1979, Ser. No. 23,112
Int. Cl.[3] B32B *31/24;* C03B *32/00;* C04B *39/00*
U.S. Cl. 156—89 16 Claims



1. A method of forming a glass-ceramic composite structure with copper based metallurgy comprising:

forming at least one green sheet comprised of a thermoplastic organic binder having dispersed therein particles of a crystallizable glass having a crystallization temperature below the melting point of copper;

forming on a surface of a first said green sheet a pattern of a nonrefractory copper based conductor forming composition wherein the predominant component of said conductor is copper;

superimposing a second said sheet on said surface of said first sheet to sandwich said pattern therebetween;

laminating said superimposed sheets together;

heating said laminate in an ambient of hydrogen and H_2O in a ratio of H_2/H_2O=about 10^{-4} to about $10^{-6.5}$ to a burn-

out temperature in the range between the anneal and softening points of said glass and maintained thereat for sufficient time to decompose and eliminate said binder,

substituting an inert atmosphere for said ambient; and

heating said laminate to the crystallization temperature of said glass for coalescence of said glass particles and crystallization thereof into a glass-ceramic structure have a copper-based conductor pattern extending within the interior thereof.

4,234,368

METHOD OF MAKING A PIPE COUPLING

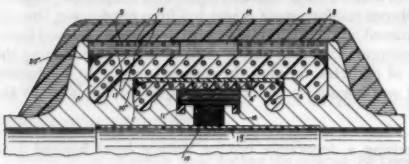
Walter Schwarz, Engerthstr. 237b, A-1020 Wien II, Austria (A-1020)

Division of Ser. No. 818,321, Jul. 22, 1977, Pat. No. 4,147,381. This application Dec. 7, 1978, Ser. No. 967,374

Claims priority, application Austria, Jul. 23, 1976, 5452/76

Int. Cl.[2] B32B *7/08;* **F16L** *21/00;* **H01R** *43/00*

U.S. Cl. 156—91 **3 Claims**



1. A method of connecting a terminal portion of a conduit, having a plurality of peripheral grooves bounded by peripheral ribs whose height decreases toward the free end of said extremity, with an external member axially spaced from said terminal portion, comprising the steps of enveloping said terminal portion and part of said external member with a first shell of filament-reinforced thermosetting material which overlaps the peripheral rib closest to said free end, providing said first shell with an inner peripheral bead received in a peripheral groove lying just beyond said closest rib, enveloping said first shell with a second shell of filament-reinforced thermosetting material having an axial tensile strength greater than that of said first shell, extending said second shell past said closest rib and the next-following rib, forming on said second shell an inner peripheral bead received in a peripheral groove lying just beyond said next-following rib, and maintaining a relative axial shiftability and independent deformability between said shells.

4,234,369

METHOD FOR REPAIRING AND RETREADING VEHICLE TIRES

Wilhelm Schelkmann, Witten, Fed. Rep. of Germany, assignor to Vakuum Vulk Holdings Limited, Nassau, The Bahamas

Continuation of Ser. No. 576,863, May 12, 1975, abandoned. This application May 11, 1978, Ser. No. 904,737

Claims priority, application Fed. Rep. of Germany, May 13, 1974, 2423062

Int. Cl.[2] B29H *17/36*

U.S. Cl. 156—95 **12 Claims**

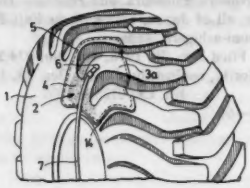
1. A method for repairing a void in a portion of a vehicle tire comprising the steps of:

placing unvulcanized rubber in the void;

covering and enclosing the unvulcanized rubber and at least the portion of the tire immediately surrounding the portion to be repaired with a flexible enclosure;

attaching the edges of said enclosure to the tire around the portion to be repaired in gas-tight relationship by means of a plastically deformable adhesive that remains effective at the elevated temperature necessary for complete vulcanization of the unvulcanized rubber;

applying gas pressure conditions to the space between said enclosure and the tire so as to evacuate air and gas occlusions from the space and apply said enclosure tightly against the tire so that said enclosure deforms into tight fitting relationship with the surface contours of the tire; and



heating the unvulcanized rubber placed in the void to raise its temperature and effect complete vulcanization thereof.

4,234,370

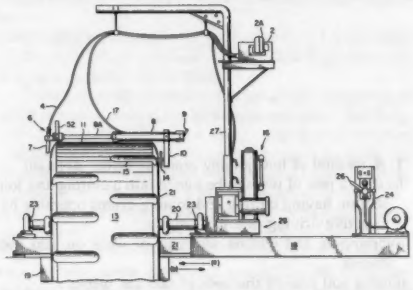
METHOD FOR RECAPPING TIRES

John C. McDonough, Essex Fells; James K. Rary, Orange; Arden Birth, Lake Parsippany, and John J. Kuzma, Jr., Wharton, all of N.J., assignors to Bandag, Incorporated, Muscatine, Iowa

Division of Ser. No. 844,788, Oct. 25, 1977, Pat. No. 4,157,727. This application Dec. 29, 1978, Ser. No. 974,252

Int. Cl.[2] B29H *17/36*

U.S. Cl. 156—95 **8 Claims**



1. A method for recapping a tire, comprising the steps of:

preparing the tire tread surface including buffing, skiving and filling tread cuts;

smoothing the prepared tire tread surface including applying prepared rubber around the circumference of the tread surface to a predetermined depth;

supporting the tire on rotatable means, with portions of the tire beads contacting the rotatable means and the rotatable means thereby carrying the weight of the tire for rendering the tire rotatable therewith;

carrying the rotatable means on longitudinally displaceable means and longitudinally displacing the longitudinally displaceable means for spanning a pit and thereby suspending the tire in the pit;

rotating the rotatable means for indexing the tire suspended in the pit to a predetermined position;

positioning a displaceable grooving head having a grooving blade on the tread surface of the indexed tire;

heating the grooving blade and displacing the grooving head across the tread surface of the tire with the grooving blade thereupon cutting a groove; and

curing the tire after grooves have been cut around the circumference thereof.

4,234,371

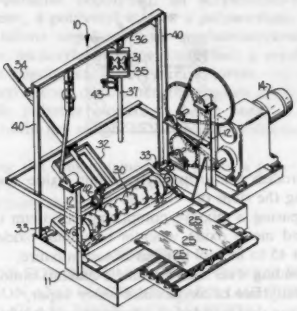
METHOD AND APPARATUS FOR APPLYING A CIRCUMFERENTIAL TREAD TO A TIRE CARCASS

Harold E. Christman, Santa Cruz, Calif., assignor to Brad Ragan, Incorporated, Spruce Pine, N.C.

Continuation-in-part of Ser. No. 849,663, Nov. 8, 1977. This application Apr. 17, 1978, Ser. No. 896,714

Int. Cl.[2] B29H *17/36*

U.S. Cl. 156—96 2 Claims



1. A method for applying a peripheral circumferential tread to the carcass of a pneumatic tire, said method comprising:

providing an elongate elastomeric tread strip having a substantially flat back and a contoured tread face with at least two longitudinally extending ribs and an intervening valley on the opposite side thereof,

laying the flat back of one end portion of at least one such tread strip against and generally tangent to the peripheral outer surface of the carcass, and

rotating the carcass about its axis to wrap the tread strip therearound, while

pressingly engaging the contoured tread face of the strip with a rotating, rapidly vibrating, continuous contoured surface having a contour which is a solid of revolution and which at least substantially matches the at least two longitudinally extending ribs and intervening valley of the tread strip as by having longitudinally spaced apart rib engaging portions and an intervening, enlarged diameter valley engaging portion to cause the same to uniformly contact the carcass throughout the width of the tread strip.

4,234,372

APPARATUS FOR AUTOMATICALLY SEALING INSULATION GLASS PANELS

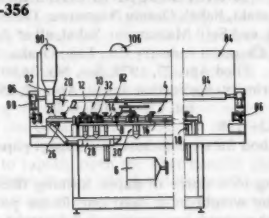
Rudolf Bernhard, and Hans Bonjour, both of Bützberg, Switzerland, assignors to Glasmatec AG, Thun, Switzerland

Filed Mar. 2, 1979, Ser. No. 17,030

Claims priority, application Switzerland, Mar. 2, 1978, 2781/78

Int. Cl.[3] C03C *27/06;* B32B *31/00*

U.S. Cl. 156—356 26 Claims



1. A mechanism for automatically sealing the joint of the four rectangular edges of multiple glazed units which comprises

(a) conveying means for advancing the multiple glazed units along a conveying path,

(b) a positioning device (**10**, **20**) and a retaining device (**30**) provided at an operation site located in said conveying path by means of which devices (**10**, **20**; **30**) each of said advancing units (**2**) can be positioned and retained in an adjusted position in which two opposite edges extend in an adjusted direction at a predetermined angle to the conveying direction (x) of said conveying means,

(c) a nozzle (**44**) fed with sealing compound by a supply device (**144**),

(d) a movement device (**82**, **84**) for moving said nozzle in said adjusted direction (x) and perpendicularly (y) to it, and

(e) a rotation device (**80**), holding said nozzle (**44**) in a rotatable position to said movement device (**82**, **84**), by means of which the nozzle (**44**) can be rotated four times to 90° with respect to said adjusted direction.

4,234,373

METHOD AND APPARATUS FOR VACUUM LAMINATION OF FLEX CIRCUITS

Joseph A. Reavill, Mira Loma, and John M. Arachi, Riverside, both of Calif., assignors to General Dynamics Corporation, Pomona Division, Pomona, Calif.

Filed Dec. 4, 1978, Ser. No. 965,976

Int. Cl.[2] E06B *7/16;* B30B *5/02;* B32B *31/00;* B29B *5/04*

U.S. Cl. 156—382 9 Claims

1. A laminating fixture assembly comprising:

an upper plate having a planar face;

a lower plate having a planar face;

a seal receiving groove formed in and extending around the periphery of each of said plates;

a unitary resilient seal for seating in said grooves and having a height for extending between and holding said plates apart with an extended space therebetween for sealing said space between said plates; and

a vacuum port formed in one of said plates and communicating with the area bound by said groove for connection to a vacuum source.

4,234,374

BI-DIRECTIONAL STEP-OVER TAPE APPLICATOR HEAD

Ed Frank, Glenolden, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 10, 1978, Ser. No. 949,476

Int. Cl.[3] B31F *1/00;* B44C *7/00*

U.S. Cl. 156—459 12 Claims

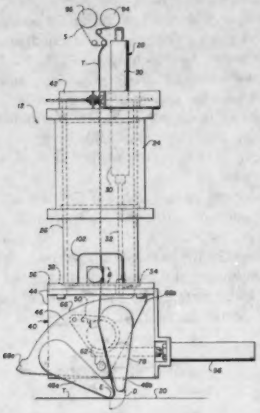
1. A tape applicator head for dispensing tape in two opposing directions onto a working surface, while maintaining the orientation of the head unchanged, comprising:

mounting means;

a pair of dispensing blocks adjacently mounted to the mounting means, the dispensing blocks having spaced symmetrically oriented tape engaging surface portions between which the tape passes and which alternately engage the tape during movement of the head in the two opposing directions, the head imparting a tension through the dispensing blocks to the tape for drawing the tape past the dispensing blocks and onto the working surface; and

control means connected to the dispensing blocks for shift-

ing the dispensing blocks in unison, for alternately engaging the dispensing block tape engaging portions with the



tape, and in the process, producing a localized tension relieving loop in the tape.

4,234,375

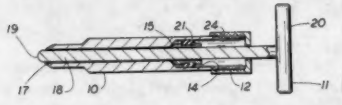
CUTTER-VACUUM-PLUNGER APPLICATOR

Richard Ciccarello, 9 Park Ave., Glen Cove, N.Y. 11542

Filed Mar. 19, 1979, Ser. No. 21,934

Int. Cl.³ B26B *27/00*; B26F *1/32*

U.S. Cl. 156—530 **1 Claim**



1. A triple action cutting, suction and plunger applicator to cut a disc of planar material and thereafter apply the cut disc to a concave cavity of a golf ball surface, comprising a barrel element having a dual diameter borehole centrally disposed therein and having a suitably sloped annular wall critically disposed therebetween, the small diameter of said borehole barrel being provided with a bottom circular cutting edge and the exterior of the barrel at the larger diameter borehole end being provided with screw threads; an integral plunger shaft element adapted to slidingly fit into the small diameter of said barrel and provided with a critically round end adapted to snugly fit a golf ball cavity, said shaft element having an integral collar critically located thereon and adapted to be disposed in the larger borehole, said collar having a pair of annular spaced-apart walls adapted to receive a flexible rubber ring, said collar having also a sloped wall adapted to mate with said sloped wall of said barrel upon innermost movement of said plunger element, said plunger element being further provided with handle means for effecting the movement thereof; a rubber pneumatic ring disposed slidingly and captively within said collar between the annular walls thereof; and an apertured interiorly screw threaded cap disposed slidingly upon said plunger shaft element adjacent said handle means to lockingly retain said shaft element to said barrel element.

4,234,376

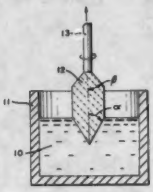
GROWTH OF SINGLE CRYSTAL BERYLLIUM OXIDE

Robert C. Linares, Sherborn, Mass., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 1, 1979, Ser. No. 80,371

Int. Cl.³ C30B *15/14*

U.S. Cl. 156—617 SP **12 Claims**



1. A process for growing beryllium oxide single crystals comprising the steps of:

(a) preparing a mixture comprising beryllium oxide and a second metal oxide wherein beryllium oxide comprises about 45 to 80 mol percent of said mixture,

(b) providing over said mixture a gaseous atmosphere substantially free of oxygen and water vapor,

(c) heating said mixture to a temperature at which the mixture becomes molten,

(d) lowering the temperature of said molten mixture to an intermediate temperature of about 1850° C. to 2050° C.,

(e) placing into the surface of said molten mixture a beryllium oxide seed crystal having an orientation within about 15° C. of (0001),

(f) rotating said seed crystal at about 1 to 15 rpm,

(g) pulling said seed crystal from said molten mixture at a rate of about 0.005 to 0.6 mm/hr and

(h) lowering the temperature at a rate of about 0.1° C./hr to 10° C./hr while heating said molten mixture using an induction heating frequency less than about 100 kHz so that beryllium oxide from said molten mixture grows on said seed crystal.

4,234,377

ASBESTOS TREATMENT

Paul A. Pezzoli, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 2, 1976, Ser. No. 737,888

Int. Cl.³ C03B *37/00*

U.S. Cl. 162—3 **26 Claims**

1. A method of treating asbestos comprising depositing on at least a portion of the asbestos a sufficient amount of a material consisting essentially of at least one metal ferrocyanide to reduce the hemolytic activity of the asbestos to at least about 9 percent hemolysis.

4,234,378

MAGNET PAPER SHEET AND A METHOD FOR MANUFACTURING THE SAME

Susumu Iwasaki, Sakai; Osamu Nagasawa; Tatsuo Takano, both of Osaka, and Seiji Matsumoto, Sakai, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan

Filed Apr. 27, 1979, Ser. No. 34,007

Claims priority, application Japan, Apr. 27, 1978, 53-51718

Int. Cl.³ D21H *3/78*

U.S. Cl. 162—138 **4 Claims**

1. A method for manufacturing a magnet paper sheet which comprises:

(a) adding to a slurry of paper forming fiber about 70–90 parts by weight of at least one ferrite powder selected from the group consisting of magnetoplumbite barium ferrite and magnetoplumbite strontium ferrite essentially consisting of particles of a primary particle size of about

0.1–2 microns and of secondary particle size smaller than about 20 microns;

(b) adding to the resultant slurry a cationic synthetic polymer electrolyte selected from the group consisting of a polyacrylamide, a polyamine, a polyamine-epichlohydrin condensation polymer and a polyethyleneimine;

(c) then adding to the resultant slurry of step (b) an anionic synthetic latex containing about 1–10 parts by weight of a synthetic polymer selected from the group consisting of a styrene-butadine copolymer, an acrylonitrile-butadiene copolymer, a polyvinyl acetate a polyacrylate, an acrylate-butadiene copolymer, an acrylate-acrylonitrile copolymer, an acrylate-styrene copolymer, a vinyl acetate-acrylate copolymer, a polyvinyl chloride, and an ethylene-vinyl acetate copolymer; the amount of the cationic synthetic polymer electrolyte being about 2–10% by weight of the dry weight of the anionic synthetic polymer latex;

(d) forming the thus obtained slurry into a paper sheet of about 0.1–2 mm in thickness; and

(e) magnetizing the paper sheet.

4,234,379

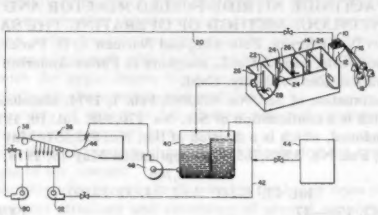
PROCESS FOR PRODUCING A UNIFORM FIBER DISPERSION AND MACHINE MADE LIGHT WEIGHT GLASS FIBER WEB MATERIAL

Bernard W. Conway, Holyoke; Nelson L. Fegley, Wilbraham, both of Mass., and James Moran, Simsbury, Conn., assignors to The Dexter Corporation, Windsor Locks, Conn.

Continuation-in-part of Ser. No. 762,492, Jan. 26, 1977, abandoned. This application Jun. 2, 1978, Ser. No. 910,881

Int. Cl.[3] D21H *5/18;* D21F *11/00*

U.S. Cl. 162—145 **17 Claims**



1. A process of continuously producing a uniform fiber dispersion for wet papermaking operations from bundles of long fibers comprising the steps of: (1) providing an initial fiber slurry consisting essentially of a dispersing liquid having a viscosity of at least about 2 cps and long fibers in the form of at least partially unopened fiber bundles, the fibers in said bundles having a fiber length of about ¼ inch and more and a length to diameter ratio of about 400:1 to 3000:1; (2) continuously flowing said fiber slurry through an in-line dispersing chamber provided with a plurality of nonstapling impellers having an impeller blade diameter size relative to the capacity of the chamber of at least 0.1 in./gal., said impellers being adapted for generating trailing regions of reduced pressure and flow disruptive turbulence of high intensity, said slurry being fed continuously through said chamber at a throughput rate sufficiently faster than conventional papermaking fiber dispersing chambers to provide a chamber dwell time of only about ten minutes and less and a dispersion factor greater than 0.005, said factor being the quotient of said relative impeller size and the throughput rate of said slurry in tons per day; (3) subjecting said slurry to said regions with said turbulence being of sufficient intensity to rapidly open the fiber bundles and disperse the individual fibers during said dwell time within said chamber; and (4) removing the dispersed fibers and liquid from the chamber as a substantially uniform and homogeneous fiber dispersion for subsequent sheet formation in a wet papermaking operation.

8. A continuous water-laid machine-made light weight inorganic fibrous web of uniform fiber formation comprising inorganic fibers having a fiber length of about ¼ inch or more and up to about 15% by weight of a binder for the inorganic fibers; said web having a basis weight of about 5–30 grams per square meter, a microvariation in basis weight of less than 10%, a macrovariation in basis weight of less than 5%, an isolated fiber bundle defect count of less than 10 per 100 square feet wherein each multi-fiber defect is an agglomeration of fibers causing a local difference in web thickness of 0.5 mils and more, and a visually perceptible uniform fiber distribution essentially devoid of "cloud effect" fiber density variations.

4,234,380

POLYMERIC SILICATE MATERIAL AND A METHOD OF MANUFACTURING THE SAME

Per G. Kihlstedt, Bromma; Hedvig E. B. Hässler, Enskede, and Kai Ödeen, Lidingö, all of Sweden, assignors to Advanced Mineral Research AB, Stockholm, Sweden

Filed Jul. 7, 1978, Ser. No. 922,662

Claims priority, application Sweden, Jul. 8, 1977, 7707999

Int. Cl.[3] C04B *43/02*

U.S. Cl. 162—152 **23 Claims**

1. A particulate silicate material having substantially a fibre- or flake-like microstructure which is suitable for use as an insulating material and as a substitute for organic fibres in paper- and board-like webs and sheets, said particulate silicate material being formed by hydrothermally treating a slurry of a pulverent staring material at a temperature of approximately 175° to 325° C. and at a pH of at least 9 in the presence of water or condensed steam, said starting material having a specific surface of at least 40,000 cm^2/cm^3 (measured according to Blaine) and consisting essentially of a natural or synthetic silicate material having a hardness exceeding 6 on the Moh's hardness scale and being at least one of the compounds having the general formulae

$$2(R^{I}O).SiO_2$$

wherein R^{I} may be the same or different and is selected from the group consisting of Mg and Fe; and

$$3(R^{II}O).R_2^{III}O_3.3SiO_2$$

wherein R^{II} may be the same or different and is selected from the group consisting of Mg, Fe, and Ca, and R^{III} is Al or Fe.

4,234,381

FIBROUS MATERIAL MADE WITH POLYMERS STABILIZED BY POLYMERIZABLE VINYL BENZYLTRIALKYL AMMONIUM SALT SURFACTANT

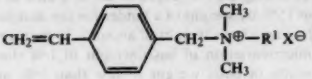
H. Scott Killam, Holland, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 741,599, Nov. 15, 1976, Pat. No. 4,152,201, which is a division of Ser. No. 405,221, Oct. 10, 1973, Pat. No. 4,017,440. This application Feb. 1, 1979, Ser. No. 9,971

Int. Cl.[3] D21H *3/40*

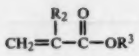
U.S. Cl. 162—158 **9 Claims**

1. A sized fibrous product made by a method comprising the steps of applying a latex of an addition polymer of ethylenically unsaturated monomers to fibrous material, and curing the polymer, characterized in that the polymer has a molecular weight of between about 250,000 and 1,000,000, and is one which comprises 0.25 to 5.0% of the total polymer composition of a polymerized vinylbenzyltrialkyl ammonium salt having the formula:



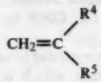
wherein R^1 is alkyl of from 8 to 22 carbon atoms and $X^{\ominus}$ is an anion, and which is emulsion copolymerized with one or more of monomers selected from:

(a) a monomer of the formula:



wherein R^2 is hydrogen or alkyl and R^3 is a straight chain, branched chain or cyclic alkyl, alkoxyalkyl, alkylthioalkyl, ureido, hydroxy lower alkyl, 2,3-epoxypropyl, amino lower alkyl, mono- or di- lower alkylamino, lower alkyl or hydroxyalkyl lower alkylamino lower alkyl, and

(b) a monomer of the formula:



wherein R^4 is hydrogen, methyl or halo and R^5 is hydrogen, halo, lower alkylanoyloxy, formyl, phenyl, N-hydroxyethyl, tolyl, methoxyethyl, 2,4-diamino-s-triazinyl, lower alkyl, or epoxy, said vinylbenzyltrialkyl ammonium salt being the sole surfactant in the latex.

4,234,382

FORMER FOR A PAPER MACHINE

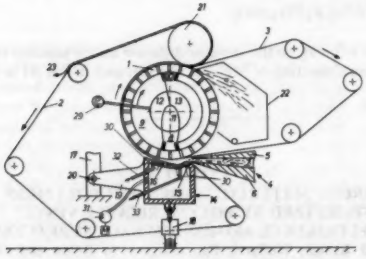
Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Dec. 7, 1978, Ser. No. 967,482

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754622

Int. Cl.³ D21F 1/36, 1/52

U.S. Cl. 162—263 **28 Claims**



1. A former for a paper machine, comprising:

a rotatable forming cylinder having a peripheral surface;

an inner belt and an outer belt, both being wrapped about said peripheral surface; said belts being so supported with respect to a section of said peripheral surface as to define between said belts a generally wedge-shaped inlet slot;

a nozzle for emitting a fiber suspension of pulp; said nozzle having an outlet opening of the width of said forming cylinder; said nozzle outlet opening being directed into said inlet slot;

a supporting device for said outer belt having the width of said forming cylinder, located downstream of said nozzle and generally at said inlet slot; said supporting device having a concave support surface, which is curved around an axis that is generally parallel to the axis of said forming cylinder, and said concave surface facing toward said outer belt, whereby as said outer belt runs into said inlet slot, said outer belt runs in contact with at least part of said concave surface;

said supporting device having an convex support surface, which is also curved around an axis generally parallel to the axis of said cylinder, and said convex surface facing toward said outer belt and being located upstream of said concave surface with respect to the flow from said nozzle, said convex surface being so placed and said nozzle outlet opening being so placed that fiber suspension emitted from said nozzle is emitted toward said inlet slot in the vicinity of said convex surface, whereby as said outer belt runs into said inlet slot, said outer belt first runs in contact with said convex surface before running in contact with said concave surface; said concave and said convex support surfaces being so placed and shaped that upon said outer belt passing over said convex support surface, said outer belt is held by said convex surface nearer to said forming cylinder peripheral surface and upon said outer belt passing over the portion of said concave surface adjacent to said convex surface, said outer belt is guided by said concave surface further from said forming cylinder peripheral surface.

4,234,383

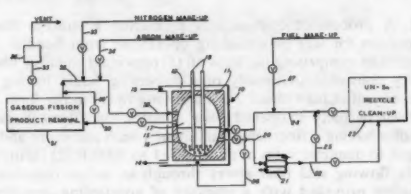
ACTINIDE NITRIDE-FUELED REACTOR AND CONTINUOUS METHOD OF OPERATING THE SAME

Robert N. Anderson, Palo Alto, and Norman A. D. Parlee, Los Altos Hills, both of Calif., assignors to Parlee-Anderson Corporation, Redwood City, Calif.

Continuation of Ser. No. 438,880, Feb. 1, 1974, abandoned, which is a continuation of Ser. No. 270,305, Jul. 10, 1972, abandoned, which is a division of Ser. No. 825,651, May 19, 1969, Pat. No. 3,843,765. This application May 15, 1978, Ser. No. 905,745

Int. Cl.² G21C 7/02, 15/00, 19/00

U.S. Cl. 176—37 **7 Claims**



1. A nuclear reaction process which comprises establishing, in an inert, refractory reactor vessel, a critical fuel system made of at least a mass comprising at least one nitride of an actinide fuel metal in solid form and, in contact therewith, a solution of the actinide fuel metal in a molten tin solvent, said solid actinide nitride fuel being disposed at the bottom portion of the reactor vessel, maintaining the critical fuel system so that fission continuously occurs, dissolving the metal fission products in said tin solution at a concentration below a critical level, maintaining the fuel system under an atmosphere of nitrogen under conditions of nitrogen pressure ranging from about 0.02 to about 2 atmospheres and of temperatures ranging from about 300° C. to 2000° C. sufficient to precipitate from solution an amount of actinide fuel nitride substantially equal to the loss of actinide fuel metal nitride from fission occurrence.

4,234,384

SUPPORT STRUCTURE FOR THE CORE OF A HIGH CAPACITY GAS COOLED HIGH TEMPERATURE REACTOR

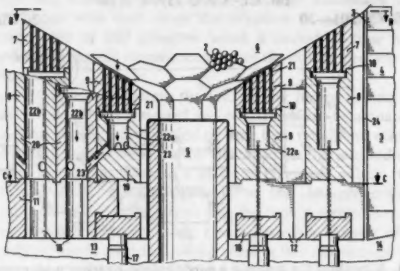
Rolf Fritz, Oftersheim, and Karl-Friedrich Kissel, Hemsbach, both of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,400

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718493

Int. Cl.[2] G21C *3/44*

U.S. Cl. 176—58 PB 5 Claims



1. Support structure for the core of a gas cooled high temperature, high capacity reactor said core comprising a bed of spherical fuel elements and being surrounded by an annular side reflector, said support structure comprising:

a plurality of layers of prismatic graphite blocks, arranged upon each other, said layers being constructed as a closed unit without expansion gaps with the blocks of one layer being interkeyed with the blocks of adjacent layers, and with the upper layers being composed of a plurality of preferably hexagonal graphite blocks;

a plurality of spherical fuel element removal passageways through the support structure;

a plurality of passages through said blocks for the cooling gas of the reactor;

a plurality of support units disposed as the lower layer of the support structure and consisting of several support segments fitted together to preferably form a hexagonal cross section;

a plurality of round columns supporting said support unit and having a column head and carrying a limited number of the hexagonal graphite blocks of said layers; and

a plurality of cooling gas channels disposed in locations of the bottom layer, representing the juncture of three support units.

4,234,385

NUCLEAR FUEL ELEMENT

Satoru Ozaki, Ichikawa; Yoshiharu Ochi, Yokohama, and Kazuo Matsumura, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 20, 1978, Ser. No. 898,373

Claims priority, application Japan, Apr. 22, 1977, 52/45805

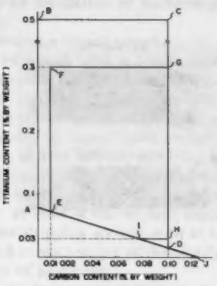
Int. Cl.[2] G21C *3/58*

U.S. Cl. 176—68 8 Claims

1. A nuclear fuel element comprising a fuel body formed of nuclear fuel material and a clad covering the fuel body, the clad being formed of an austenitic stainless steel consisting essentially of nickel, chromium, silicon in an amount of more than 0 to less than 0.7% by weight, carbon and titanium in amounts satisfying the relationship:

$$17[C]+27[Ti]\geq 2.1$$

where [C] represents the carbon content in % by weight and [Ti] the titanium content in % by weight, with the carbon content falling within the range 0.01 to 0.1% by weight and the titanium content falling within the range 0.03 to 0.5% by



weight, and the balance of iron, wherein said austenitic stainless steel is subjected to a final heat treatment at a temperature enough to permit the carbon and titanium to be formed substantially completely into a solid solution.

4,234,386

CONTINUOUS COKE MAKING

Harold T. Stirling, 39 Hoodridge Dr., Mount Lebanon, Pa. 15228

Filed Mar. 22, 1979, Ser. No. 22,872

Int. Cl.[3] C10B *47/00, 53/08*

U.S. Cl. 201—6 6 Claims

1. A method of preparing metallurgical reductants from coal comprising the steps of mixing a feed consisting essentially of an organic binder and one dry particulate coal capable of coalescing upon heating, compacting the resulting mixture into shaped forms, and heat-treating the shaped forms in a sequential temperature increasing regimen that limits the volatile matter expulsion to a maximum of 0.05 percent per minute while raising the temperature at a rate of less than 10° F. per minute during that period of time at which the coal is at a temperature at which there is a tendency for the coal to soften.

4,234,387

COKING POOR COKING COALS AND HYDROCRACKED TAR SAND BITUMEN BINDER

Biswa N. Nandi; Keith Belinko; Lynn A. Ciavaglia; Barry B. Pruden, all of Ottawa, and Jean-Marie D. Denis, Munster, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa, Canada

Filed Oct. 24, 1978, Ser. No. 954,322

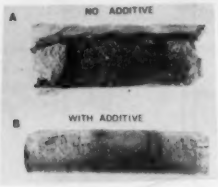
Claims priority, application Canada, Apr. 28, 1978, 30227

Int. Cl.[3] C10B *55/02*

U.S. Cl. 201—23 10 Claims

1. In a process for manufacturing metallurgical coke which comprises adding binder pitch to particles of poor coking coals

and subjecting the coal with binder pitch added thereto to carbonization, the improvement which comprises utilizing as



the binder pitch a bitumen residue obtained from hydrocracking of bitumen from tar sands.

4,234,388

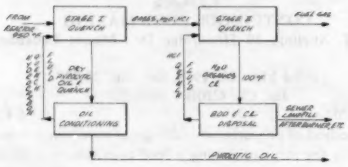
REMOVAL OF CHLORINE FROM PYROLYTIC OILS

George M. Mallan, Los Angeles, and George T. Preston, Claremont, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 863,857, Dec. 20, 1977, abandoned, which is a continuation of Ser. No. 684,644, May 10, 1976, abandoned. This application Aug. 10, 1979, Ser. No. 65,737

Int. Cl.[3] C10B *57/02;* **C10G** *9/16*

U.S. Cl. 201—25 **30 Claims**



1. In a process for the pyrolysis of solid organic wastes which includes solid organic wastes which yield hydrogen chloride upon pyrolysis, and wherein dried, comminuted solid organic waste is passed through a pyrolysis zone maintained at a temperature from about 600° F. to about 2000° F. to form a pyrolysis product stream which comprises char and a gaseous component comprising water vapor, hydrogen chloride, and organic constituents comprising biodegradable organic constituents, a condensible pyrolytic oil and hydrocarbons, the method of recovering the condensible pyrolytic oil and a gaseous residue substantially free of hydrogen chloride which comprises:

(a) separating the char from the pyrolysis product stream to form a char-free pyrolysis effluent;

(b) contacting the char-free pyrolysis effluent with a hydrocarbon quench fluid which is substantially immiscible in pyrolytic oil in a pyrolytic oil quench zone to cool the char-free pyrolysis effluent to a temperature above the dew point of water and below the condensation temperature of a substantial portion of the condensible pyrolytic oil to form a two-phase immiscible liquid mixture of pyrolytic oil and the hydrocarbon quench fluid and leave a gaseous residue comprising hydrogen chloride, water vapor and organic constituents;

(c) separating the hydrocarbon quench fluid from the pyrolytic oil to recover the pyrolytic oil and recycling the separated hydrocarbon quench fluid to the pyrolytic oil quench zone; and

(d) passing the gaseous residue to a hydrogen chloride quench zone where the gaseous residue is contacted with an aqueous hydrogen chloride quench solution to cool the gaseous residue below the dew point of water to condense water vapor and extract hydrogen chloride from the gaseous residue.

4,234,389

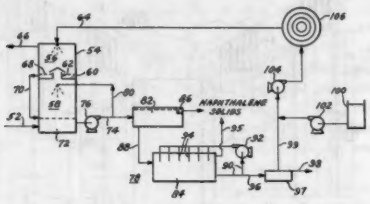
COOLING NAPHTHALENE-BEARING WATERS AND GAS STREAMS

James B. Lynn, Bethlehem; Otto A. Homberg, and Kenneth R. Burcaw, Jr., both of, Easton, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 21, 1979, Ser. No. 13,583

Int. Cl.[2] C07C *15/14, 7/00*

U.S. Cl. 201—30 **20 Claims**



1. A method for cooling a naphthalene-bearing water stream that avoids heat exchanger blockage comprising

(a) providing a naphthalene-bearing water stream which contains less than about 225 ppm suspended naphthalenic solids,

(b) injecting an amount of a substantially water immiscible solvent for naphthalene into the naphthalene-bearing water stream which amount is effective to prevent blockage of a downstream indirect heat exchanger,

(c) mixing the solvent and water stream to afford a dispersion of the solvent in the water stream, and

(d) cooling the water stream containing the dispersed solvent in the indirect heat exchanger.

4,234,390

SYSTEM FOR CONTROL OF A COKING PLANT

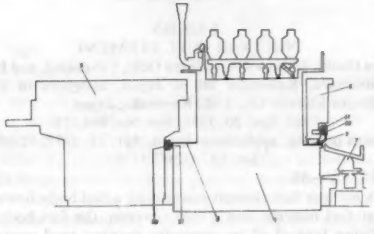
Jacobus H. Van Egmond, Alkmaar, and Lichtenveldt, Castricum, both of Netherlands, assignors to Hoogovens IJmuiden, B. V., IJmuiden, Netherlands

Filed May 3, 1978, Ser. No. 902,369

Claims priority, application Netherlands, May 11, 1977, 7705188

Int. Cl.[3] C10B *5/00, 27/04, 45/00*

U.S. Cl. 202—262 **1 Claim**



1. In a coking plant having a row of coking chambers for the coking of coal by dry distillation, a coke pusher machine movable along the row for pushing coke out of each chamber after coking of a charge of coal therein, a coke leveller member mounted on the coke pusher machine and movable to level the coke charge in a chamber before coking, induction coils ar-

ranged on the row of chambers and on the coke pusher machine for use in ascertaining by means of said induction coils the correct alignment of the coke pusher machine in relation to a given chamber, central data processing means which effects interlocking of operations in the coking plant, coking time control and coke oven selection, an ascension pipe for each chamber for the discharge from the chamber of the gases evolved during coking, means for injecting steam into the ascension pipe through a steam valve controlling passage of steam into the pipe, which valve is controlled by an electromagnetically operated air valve so as to create a sub-atomospheric pressure in the chamber and timing means for control of said injecting means, which timing means, after a chamber has been charged with coal, stops the injection of steam to the ascension pipe of that chamber when a period of time has elapsed following the commencement of the coking process in the chamber,

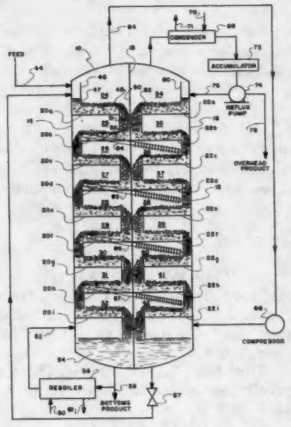
the improvement wherein the said timing means is electrically operated, is arranged and constructed to be actuated to start timing a said period of time by a command transmitted from the coke pusher machine via the said induction coils in the form of a series of electrical pulses, the timing means being connected to the data-processing means which is arranged so that the timing means cannot be actuated to start timing a said period in respect of a selected oven until the coking plant is in a desired condition for charging of that chamber, the timing means comprising a pulse counter and a pulse frequency generator which is adjustable to vary the frequency, there being a bistable flip-flop circuit between the said pulse counter and the said air valve, which circuit controls the air valve.

4,234,391

CONTINUOUS DISTILLATION APPARATUS AND METHOD

Junior D. Seader, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Oct. 13, 1978, Ser. No. 950,969
Int. Cl.[3] B01D *3/32, 1/28*
U.S. Cl. 203—26 **5 Claims**



1. A distillation apparatus comprising:

a vertical column;

a longitudinal divider completely segregating the column into a stripping section and a rectifying section, the divider allowing each of the stripping section and the rectifying section to be maintained at different pressures; and

a plurality of heat pipes transecting the divider and extending between the stripping section and the rectifying section for transferring thermal energy from the rectifying section to the stripping section.

3. A method for improving thermodynamic efficiency during the continuous distillation of multicomponent fluid mixtures comprising:

vertically orienting a closed vessel;

segregating the vessel with a longitudinal divider into a stripping section and a parallel rectifying section, the divider accommodating maintaining different pressures in the stripping section and the rectifying section;

forming a plurality of vapor/liquid contact stages in each of the stripping section and the rectifying section;

mounting a plurality of heat pipes between the stripping section and the rectifying section thereby thermally interconnecting at least some of the vapor/liquid contact stages of the stripping section with at least some of the vapor/liquid contact stages of the rectifying section with the plurality of heat pipes;

introducing a multicomponent fluid mixture into the stripping section adjacent the upper end of the stripping section as a feed stream;

separating vapor from the multicomponent fluid mixture in the stripping section during passage through the vapor/liquid contact stages, said vapor representing a lower boiling point fraction of the feed stream;

operating the rectifying section at a first pressure and at a higher temperature than the stripping section by removing said vapor from the stripping section and compressing said vapor to a second pressure prior to introducing said vapor into the rectifying section;

condensing vapor from the rectifying section and recycling a portion of the condensed vapor as a reflux liquid into the rectifying section; and

transferring thermal energy from the rectifying section to the stripping section with the plurality of heat pipes thereby conserving energy during the continuous distillation of said feed stream.

4,234,392

OIL SOLUBLE PHOTOGRAPHIC COUPLER RECLAMATION PROCESS

Sugihiko Tada; Kazuhiko Yanagihara, and Jun Arakawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 24, 1978, Ser. No. 927,202
Claims priority, application Japan, Aug. 3, 1977, 52-93231
Int. Cl.[2] B01D *3/12;* **G03C** *1/08*
U.S. Cl. 203—91 **10 Claims**

1. A process for reclaiming a photographic coupler from an aqueous oil-in-water emulsion of a coupler solvent oil having an oil-soluble photographic coupler dissolved therein comprising separating the coupler solvent oil containing the photographic coupler dissolved therein from the aqueous oil-in-water emulsion, and subjecting the separated coupler solvent oil containing the photographic coupler dissolved therein to a high vacuum molecular distillation whereby only the coupler solvent oil is removed as a distillate.

4,234,393

MEMBRANE PROCESS FOR SEPARATING CONTAMINANT ANIONS FROM AQUEOUS SOLUTIONS OF VALUABLE METAL ANIONS

Malcolm T. Hepworth, Golden, and John M. Laferty, Wheatridge, both of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Apr. 18, 1979, Ser. No. 31,325
Int. Cl.[3] C25C *1/22*
U.S. Cl. 204—1.5 **28 Claims**

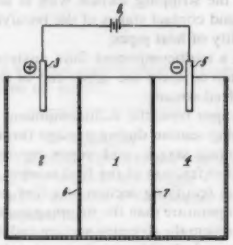
1. A process for refining a pregnant solution containing alkali metal cations, at least one oxyanion of a valuable metal selected from the group consisting of molybdenum, tungsten, vanadium, and uranium, and at least one contaminant anion

selected from the group consisting of PO_4^{-3}, SO_4^{-2}, NO_3^-, Cl^-, ClO_3^-, and ClO_4^-, which comprises:

(a) providing a first electrolytic cell having an anode compartment equipped with an insoluble anode, a cathode compartment equipped with an insoluble cathode, and a feed compartment separating the anode compartment from the cathode compartment, said anode compartment being separated from said feed compartment by an anion-permselective membrane and said cathode compartment being separated from said feed compartment by a cation-permselective membrane;

(b) establishing an aqueous solution in the anode compartment so that the anode is immersed therein;

(c) establishing an aqueous solution in the cathode compartment so that the cathode is immersed therein;



(d) feeding to the feed compartment pregnant solution having a contaminant anion concentration of at least about 50 grams per liter and a valuable metal oxyanion content of between about 25 and 200 grams per liter;

(e) adjusting the pH of said pregnant solution in said feed compartment to a value between about 0.5 and about 4; and

(f) impressing an electric potential of at least about 10 volts between the anode and cathode until the contaminant anion concentration in the pregnant solution is lowered by at least about 25 grams per liter, whereby contaminant anions from said pregnant solution migrate preferentially to the anode compartment to generate a strong acid solution, the alkali metal cations migrate to the cathode compartment to generate a strong caustic solution.

4,234,394

METHOD FOR PRODUCING AN INFORMATION CARRIER DISC

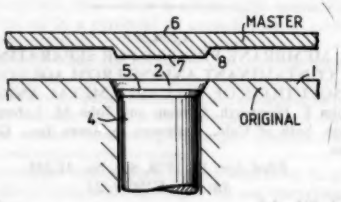
Heinz Borchard, Nortorf, Fed. Rep. of Germany, assignor to Teldec Telefunken-Decca Schallplatten GmbH, Hamburg, Fed. Rep. of Germany

Filed May 16, 1979, Ser. No. 39,573

Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821297

Int. Cl.³ C25D *1/10*

U.S. Cl. 204—5 **11 Claims**



1. In a method for producing a record copy disc by cutting a spiral groove into an original provided with centering means centered relative to the spiral groove, electrochemically transferring the groove pattern from the original to a master and forming the copy disc from the master, the improvement wherein said step of transferring comprises reproducing the centering means electrochemically on the master, and said step of forming the copy disc comprises forming centering means on the copy disc from the reproduced centering means on the master.

4,234,395

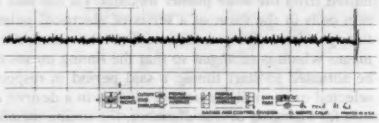
METAL COMPOSITES AND LAMINATES FORMED THEREFROM

Betty L. Berdan, Willowick, and William M. King, Mentor, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 652,139, Jan. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 431,060, Jan. 7, 1974, abandoned. This application Oct. 18, 1978, Ser. No. 952,512

Int. Cl.³ C25D *1/04, 5/44*

U.S. Cl. 204—12 **2 Claims**



1. A method of forming a metal composite for use as a component of a laminate for printed circuits comprising:

(a) mildly and uniformly etching an aluminum alloy surface with an aqueous solution of an alkaline etchant, said alloy consisting of at least about 99 wt. % aluminum, up to about 1.00 wt % silicon plus iron, from about 0.05 to about 0.20 wt. % copper, up to about 0.05 wt. % manganese and up to about 0.10 wt. % zinc,

(b) electrocathodically depositing directly on said etched surface a foil of copper to a thickness within the range of about 0.1 to about 0.4 mils, the uniformity of etching performed in step (a) being characterized by the copper foil being uniformly adhered to the aluminum alloy surface, and

(c) electrocathodically overplating the exposed face of the copper foil with a coating of a material selected from the group consisting of zinc and indium, said coating having a thickness within the range of about 10 to about 25 microinches and providing a peel strength between the copper foil and said aluminum alloy surface with a value within the range of about 0.3 to about 2 lbs./in. of width of copper foil, after bonding the overplated face of the copper foil by heat and pressure to a resinous substrate.

4,234,396

CHROMIUM PLATING

Mark Perakh, 110 E. Talpiot; Hana Ginsburg, 413 Neve Yaacov; Erna Salomon, 2/9 Mavo Kzia St.; Valentina Shargorodsky, 28/6 Ramot, and Liuba Rubinstein, 116/19 Chevroni St., all of Jerusalem, Israel

Filed Mar. 7, 1979, Ser. No. 18,365

Claims priority, application Israel, Mar. 8, 1978, 54230; Mar. 8, 1978, 54231

Int. Cl.³ C25D *3/06*

U.S. Cl. 204—51 **12 Claims**

1. A plating bath for electroplating various metals with chromium, consisting essentially of the composition resulting from the combination of 100–1600 g/l of chromium trioxide and one or more of the following:

0.3–15 weight % Cl or Cl^- based on the chromium trioxide, and

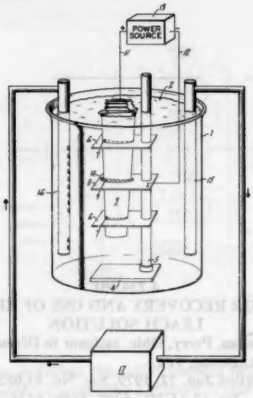
0.5–10 weight % I or I^- based on the chromium trioxide.

4,234,397

NONDESTRUCTIVE METALLOGRAPHIC EXAMINATION OF GAS TURBINE COMPONENTS

Charles T. Torrey, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 15, 1978, Ser. No. 933,945
Int. Cl.[2] C25F *3/02, 5/00*
U.S. Cl. 204—129.35 **3 Claims**



1. A nondestructive method for examining gas turbine engine components, of the type having a superalloy substrate and a protective aluminide coating thereon, after service including the steps of:

a. mechanically abrading the blade surface to remove any oxide coating;

b. immersing the blade in an electrolytic solution in which an electrode is also immersed;

c. applying a voltage between the blade and the electrode, through the electrolytic solution, so that the blade is positive respect to the electrode;

d. regulating the voltage to cause electropolishing of the component until the aluminide coating is essentially removed to expose the substrate;

e. changing the voltage by means external to the electrolyte-blade-electrode combination, to cause electroetching of the underlying substrate;

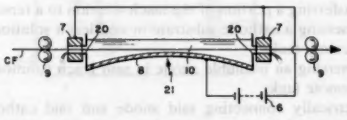
f. examining the etched substrate, by optical or electron microscopy techniques to determine the metallographic structure and gamma prime morphology so as to determine the condition of the substrate and its suitability for further use.

4,234,398

CARBON FIBER SURFACE TREATMENT

Ryuichi Yamamoto, Ehime, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 6, 1979, Ser. No. 27,880
Claims priority, application Japan, Apr. 12, 1978, 53-42098
Int. Cl.[3] C01D *7/34;* B01K *1/00*
U.S. Cl. 204—130 **15 Claims**



1. In a method for continuously surface treating a carbon fiber, wherein the fiber is connected electrically to an anode current input having a predetermined location and conducted on the run with successive portions of said fiber moving toward or away from said input and through an electrolytic treatment bath which contains an electrolyte and a cathode, wherein said cathode is positioned along the fiber path in the bath and wherein the fiber is subjected to electrolytic oxidation treatment in the bath, the method step selected from the group consisting of

(a) conducting moving portions of the fiber closer to the cathode in the bath as said fiber portions move away from the anode current input, and

(b) moving the fiber portions farther from the cathode in the bath as they move toward said anode current input, whereby the current density applied to the fibers is maintained substantially constant along the fiber path through said bath.

4,234,399

RADIATION CURABLE COMPOSITIONS CONTAINING ACYLOIN URETHANE COMPOUNDS

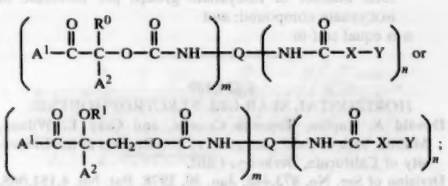
John R. McDowell; Dennis D. Howard, and Vincent J. Pascarella, all of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Division of Ser. No. 950,970, Oct. 13, 1978. This application Jun. 18, 1979, Ser. No. 49,664
Int. Cl.[3] C08F *2/46*
U.S. Cl. 204—159.15 **25 Claims**

1. A coating composition comprising

(a) a free radical-polymerizable material selected from the group consisting of monomers, polymers and mixtures thereof; and

(b) at least one acyloin urethane compound having the formula

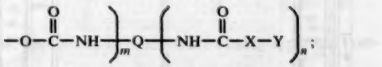


or

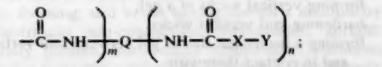
wherein

A^1 and A^2 are the same or different and each is benzenoid or nonbenzenoid aromatic radical;

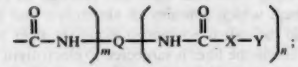
R^0 is hydrogen, or an aliphatic, cycloaliphatic or aromatic radical containing from 1 to 9 carbon atoms, or $—OR^2$, or



R^1 is hydrogen, or an aliphatic, cycloaliphatic or aromatic radical containing from 1 to 9 carbon atoms, or $—R^3—O—R^4$, or

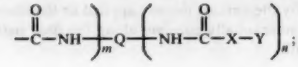


R^2 is a hydrogen, or an aliphatic, cycloaliphatic or aromatic radical having from 1 to 9 carbon atoms, or $—R^3—O—R^4$, or



R^3 is a divalent aliphatic, cycloaliphatic or aromatic radical containing from 1 to 9 carbon atoms;

R^4 is hydrogen, or an aliphatic, cycloaliphatic or aromatic radical having from 1 to 9 carbon atoms; or



Q is the monovalent or polyvalent residue of a monomeric aliphatic, cycloaliphatic or aromatic isocyanate compound having at least one isocyanate group or of an isocyanate-functional polymeric material characterized by the presence of at least one isocyanate group, which residue remains after reaction of all isocyanate groups of such monomeric compounds and polymeric materials with at least one saturated or unsaturated compound containing at least one isocyanate-reactive active hydrogen atom;

X is selected from the group consisting of —O—, —S— and $>N—R^5$, wherein R^5 is hydrogen or an alkyl group having from 1 to 9 carbon atoms;

Y is hydrogen or the organic residue of a saturated or unsaturated organic compound containing at least one isocyanate-reactive active hydrogen atom, which residue remains after reaction of at least one such active hydrogen atom with an isocyanate moiety;

m is a number in the range from 1 to f, wherein f is the total number of isocyanate groups per molecule of isocyanate compound; and

n is equal to f-m.

4,234,400

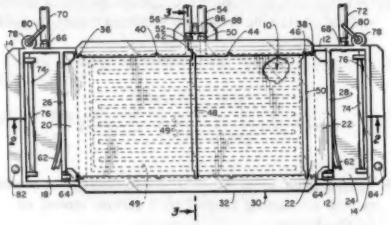
HORIZONTAL SLAB GEL ELECTROPHORESIS

Donald A. Kaplan, Topanga Canyon, and Gary L. Wilcox, Malibu, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 873,448, Jan. 30, 1978, Pat. No. 4,151,065. This application Jan. 26, 1979, Ser. No. 6,826

Int. Cl.[2] G01N *27/26, 27/28*

U.S. Cl. 204—180 G **8 Claims**



1. An electrophoresis method comprising:

forming vertical wicks of a gel;

hardening said vertical wicks;

forming a horizontal slab of gel between said vertical wicks and in contact therewith;

forming a plurality of sample wells simultaneously with the formation of said horizontal slab;

applying an electric current to said horizontal slab through said vertical wicks whereby sample molecules migrate into said horizontal gel and are resolved from each other on the basis of size and/or charge.

4,234,401

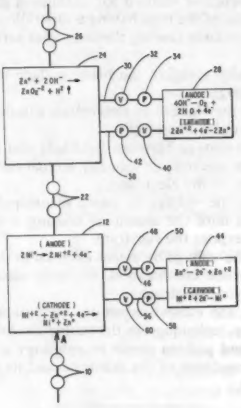
METHOD FOR RECOVERY AND USE OF ZINC FROM A LEACH SOLUTION

James R. Brannan, Perry, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jun. 22, 1979, Ser. No. 51,053

Int. Cl.[3] C25C *1/08, 1/16, 1/24*

U.S. Cl. 204—149 **6 Claims**



1. In a process for the deposition of an active nickel-zinc alloy coating on cathode substrates to be utilized in electrolytic processes wherein a nickel-zinc alloy is electrodeposited on said cathode from a plating solution containing nickel ions and zinc ions and utilizing a nickel anode followed by the leaching of the zinc component of the alloy deposit into a solution of 50–400 grams per liter sodium hydroxide, a process for the recovery of zinc from the leach solution comprising the steps of:

transferring a portion of the leach solution to a remote tank;

immersing a cathode substrate in said leach solution in said remote tank;

immersing an insoluble anode in said leach solution in said remote tank;

electrically connecting said anode and said cathode to a source of direct current and electrolyzing said leach solution, and

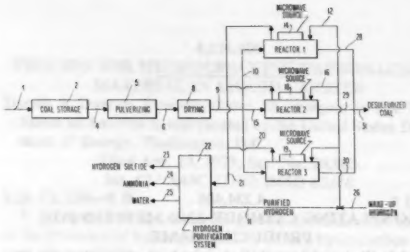
removing zinc metal deposited on said cathode from said remote tank.

4,234,402

SULFUR REMOVAL FROM CRUDE PETROLEUM

Chalmer G. Kirkbride, 13 Elk Forest, R.D. #2, Elkton, Md. 21921

Division of Ser. No. 831,170, Sep. 7, 1977, Pat. No. 4,123,230.
This application Oct. 24, 1978, Ser. No. 954,302
Int. Cl.[3] C07C 3/24
U.S. Cl. 204—162 R 8 Claims



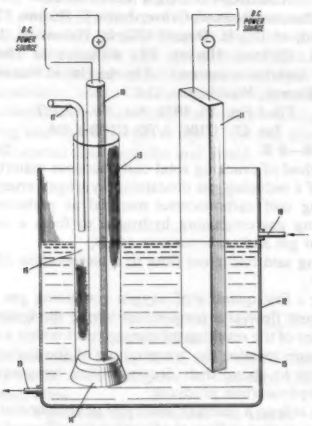
1. Process for reducing the sulfur content of crude petroleum which comprises subjecting a mixture of said crude petroleum having a free moisture content below 0.5 weight percent and hydrogen to microwave energy.

4,234,403

ELECTROLYTIC PROCESS FOR THE PRODUCTION OF STANNOUS CHLORIDE PRODUCTS

John A. Franks, Jr., Vermilion, Ohio, assignor to Vulcan Materials Company, Birmingham, Ala.

Filed Jun. 15, 1979, Ser. No. 48,829
Int. Cl.[3] B01D 13/02; C25C 1/14
U.S. Cl. 204—180 P 14 Claims



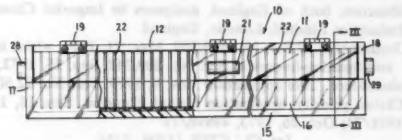
1. An electrolytic process for the production of stannous salts in an electrolytic cell, comprising an anode compartment and a cathode compartment and a cationic permselective barrier between the anode and cathode compartments comprising introducing stannic anions into the cathode compartment of the electrolytic cell, providing an electrolyte in the anode compartment, applying direct current to the anode and cathode to produce stannous ions in the cathode compartment while substantially simultaneously preventing migration of stannous anions between the cathode and anode compartments by maintaining an electrolyte fluid impermeable cationic permselective barrier between the anode and cathode, removing produced gas from the anode compartment and removing the stannous ions from the cathode compartment.

4,234,404

HORIZONTAL ELECTROPHORESIS OR ISOELECTRIC FOCUSING APPARATUS

Paul S. Satoh, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 11, 1979, Ser. No. 29,063
Int. Cl.[3] G01N 33/16, 27/26
U.S. Cl. 204—299 R 7 Claims



1. An electrophoresis or isoelectric focusing apparatus comprising:

an elongated, electrically non-conductive, horizontal vessel having wall means defining an impermeable side wall and a pair of impermeable end walls; a pair of horizontally spaced-apart electrodes disposed inside said vessel close to the opposite ends thereof and adapted to be connected to a source of electrical potential for electrophoresis or isoelectric focusing; said vessel having therein a multiplicity of electrically non-conductive, impermeable, upright, generally parallel, horizontally spaced-apart partitions extending from one portion of said side wall transversely to the longitudinal axis of said vessel and partway across the cross section of said vessel, said partitions terminating at locations transversely spaced from the portion of said side wall that is opposed to said one portion of said side

wall, so as to divide the space within said vessel into an unobstructed zone defined by the remainder of the cross section of said vessel and which extends from one longitudinal end to the other longitudinal end of said vessel and a multitude of separate horizontally spaced-apart compartments the inner ends of which compartments are open to said unobstructed zone, said compartments otherwise being isolated from each other, whereby a layer of starting species and an electrophoresis or isoelectric focusing medium can be placed in said unobstructed zone and subjected to electrophoresis or isoelectric focusing therein and then fractions of said starting species can be moved into said compartments by turning said vessel about the horizontal longitudinal axis thereof.

4,234,405

ELECTRODE FOR ELECTROCHEMICAL PROCESSES

Bernard Hesketh, Frodsham, and Nicholas W. J. Pumphrey, Runcorn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 450,200, Mar. 11, 1974, which is a continuation-in-part of Ser. No. 289,742, Sep. 15, 1972, abandoned. This application Nov. 8, 1979, Ser. No. 92,507

Claims priority, application United Kingdom, Sep. 16, 1971, 431901/71; Oct. 26, 1973, 49898/73

Int. Cl.[3] C25B *11/06, 1/36*

U.S. Cl. 204—290 F **13 Claims**

1. In an electrode suitable for use as an anode in a mercury cathode cell which comprises a support member made of a film-forming metal or a film-forming metal alloy and an electrocatalytically active coating thereon comprising an electroconducting material selected from the group consisting of platinum group metals, oxides thereof and mixtures of at least one such metal or oxide with one or more non-noble metal oxides, said coating being obtained by thermally decomposing a precursor for each component thereof, the improvement whereby said coating consists of a matrix of said electroconducting material having embedded therein a non-conducting refractory material in discrete form and having a resistivity greater than about 10 ohms-cm, said embedded refractory material being selected from the group consisting of:

(a) particulate non-conducting refractory material wherein the particles have a size range of up to 200 microns,

(b) fibrous non-conducting refractory material wherein no dimension of individual fibers exceeds 1 mm and

(c) mixtures of such fibrous and particulate refractory material, the embedded refractory material being present in particulate and/or fibrous form in admixture with the precursors for said coating before said precursors are thermally decomposed to form said coating and remaining in said form throughout the preparation of said coating, the proportion of embedded refractory material embedded in the coating being 5% to 95% by volume calculated on the total volume of the components in the coating, said embedded refractory material modifying the surface characteristics of the coating and thereby increasing the electrical contact resistance thereof to mercury with consequent reduction in undesirable shorting effects, said embedded refractory material comprising zirconium silicate.

4,234,406

NONPLATING CATHODE AND METHOD FOR PRODUCING SAME

Richard A. Bird, and Lowell W. Austin, both of Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 921,674, Jul. 3, 1978, Pat. No. 4,160,703, which is a division of Ser. No. 830,834, Sep. 6, 1977, Pat. No. 4,145,267. This application Apr. 5, 1979, Ser. No. 27,450

Int. Cl.[3] C25D *17/10*

U.S. Cl. 204—292 **1 Claim**

1. A lead cathode intrinsically having a surface which is immune to plating zinc thereon when immersed in an electrolytic galvanizing bath.

4,234,407

REACTOR AND METHOD FOR HYDROCRACKING CARBONACEOUS MATERIAL

Dennis A. Duncan, Downers Grove; Justin L. Beeson, Clarendon Hills, both of Ill.; R. Donald Oberle, Hammond, Ind., and Henry A. Dirksen, Harvey, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 26, 1979, Ser. No. 15,257

Int. Cl.[3] C10G *1/00;* **C10B** *1/04*

U.S. Cl. 208—8 R **14 Claims**

1. A method of cracking solid carbonaceous material in the presence of a reducing gas containing hydrogen comprising:

entraining said carbonaceous material as particles in the reducing gas containing hydrogen to form a cocurrent flow of gas and carbonaceous solids;

preheating said cocurrent flow to a temperature of at least 800° F.;

injecting a first quantity of oxygen containing gas into the cocurrent flow at a temperature above the ignition temperature of the resulting mixture to react within a combustion zone to raise the temperature of the carbonaceous particles to above their decomposition temperature and form hydrocarbon products;

injecting at least a second quantity of oxygen containing gas into the cocurrent flow at a location downflow of said first injection to again produce at least another combustion zone and a cocurrent flow temperature of about 1400°–1800° F. at a pressure of about 1500–2500 psig to decompose and hydrogenate carbonaceous material to form hydrocarbon products;

quenching the cocurrent flow of gas and solids to below the temperature at which dehydroxylation and dealkylation of aromatics proceeds toward increasing benzene concentration; and

recovering the hydrocarbon products from the process.

4,234,408

PROCESS FOR HYDROCRACKING CARBONACEOUS MATERIAL IN LIQUID CARRIER

Dennis A. Duncan, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 13, 1979, Ser. No. 29,963

Int. Cl.³ A45C *11/02*; B65D *85/18*

U.S. Cl. 208—8 R **7 Claims**

1. A method of hydrocracking solid carbonaceous material in the presence of hydrogen gas to produce hydrocarbon products comprising in combination:

mixing recycled liquid with feed particles of carbonaceous solids to form a slurry;

injecting hydrogen gas into a flow of said slurry to form a flow of multiphase mixture including carbonaceous particles, liquid and hydrogen gas;

heating said multiphase flow to a temperature of 600°–1200° F. to dissolve agglomerating bitumins and polynuclear aromatics into the liquid phase;

heating said flow to a temperature of 1200°–1800° F. to vaporize said liquid and form a substantially liquid-free gas-solids flow and to decompose and reduce the concentration of polynuclear aromatics within said gas-solids flow;

quenching said gas-solids flow to a temperature below 1200° F. to condence and separate liquid along with remaining carbonaceous char solids from the remaining gases;

fractionating said condensed liquid to form at least three fractions according to boiling point comprising light oil (**39**), relatively high boiling point liquid (**38**) and heavy oil (**37**);

withdrawing said light oil (**39**) as a hydrocarbon product;

recycling said relatively high boiling point liquid (**38**) to slurry said feed particles of carbonaceous material;

reacting said heavy oil (**37**) along with said remaining carbonaceous char solids with steam and oxygen at gasifier conditions to produce hydrogen gas, said char and heavy oil containing about one-half the carbonaceous material introduced in said carbonaceous feed particles; and

returning said hydrogen gas to inject into said slurry flow of carbonaceous feed particles and liquid.

4,234,409

PROCESS FOR THE PRODUCTION OF LUBRICATING BLEND STOCKS

Richard D. Schieman, Rocky River, and John H. Steffens, Lynhdurst, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Feb. 28, 1979, Ser. No. 16,046

Int. Cl.³ C10G *71/00, 73/02*

U.S. Cl. 208—28 **6 Claims**

1. In a process for the production of lubricating oil blend stocks in which a refinery stream comprising an atmospheric distillation column residue is vacuum distilled, extracted and dewaxed; the improvement comprising including in said refinery stream a hydrogenated gas oil having at least 80% boil off in the range of 500° to 1200° F.

4,234,410

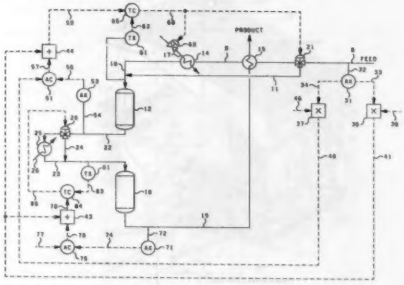
TEMPERATURE CONTROL OF EXOTHERMIC REACTIONS

Carl S. Kelley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 23, 1979, Ser. No. 23,355

Int. Cl.³ B01J *8/04*; C07C *7/167*

U.S. Cl. 208—57 **36 Claims**



19. A method for removing a first constituent in a feed stream, wherein said feed stream is supplied to at least two reaction zones in series, comprising the steps of:

establishing a first signal representative of the concentration of said first constituent in said feed stream being supplied to the first reaction zone of said at least two reaction zones in series;

establishing a second signal representative of the percentage of said first constituent, in said feed stream flowing to said first reaction zone, which should be removed in said first reaction zone;

establishing a third signal representative of the desired concentration of said first constituent in said feed stream flowig from said first reaction zone to the second reaction zone of said at least two reaction zones in series in response to said first signal and said second signal;

establishing a fourth signal representative of the actual concentration of said first constituent in the feed stream flowing from said first reaction zone to said second reaction zone;

establishing a fifth signal, representative of the temperature of said feed stream entering said first reaction zone necessary to maintain the desired concentration of said first constituent in the feed stream flowing from said first

reaction zone to said second reaction zone, in response to said third signal and said fourth signal;

establishing a sixth signal representative of the actual temperature of the feed stream flowing to said first reaction zone;

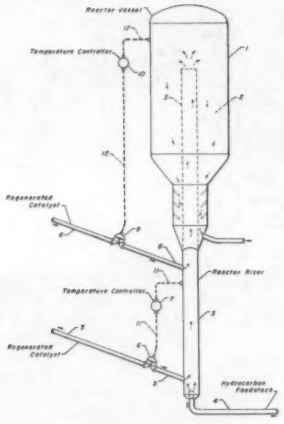
comparing said fifth signal and said sixth signal and establishing a seventh signal responsive to the difference between said fifth signal and said sixth signal; and

manipulating the temperature of said feed stream flowing to said first reaction zone in response to said seventh signal.

4,234,411
FLUID CATALYTIC CRACKING PROCESS

Gregory J. Thompson, Waukegan, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 15, 1979, Ser. No. 20,771
Int. Cl.³ C10G 11/18, 37/02
U.S. Cl. 208—74 **1 Claim**



1. A process for catalytically cracking a hydrocarbonaceous feedstock wherein fluidizable cracking catalyst that has become deactivated with coke deposits is withdrawn from a hydrocarbon cracking reaction zone, stripped of volatile material, passed to a regeneration zone for removal of said coke deposits and recycled thereafter in divided streams to a reactor riser situated upstream of said hydrocarbon cracking reaction zone, wherein said manner of recycling said stripped and regenerated catalyst to said reactor riser is controlled by:

(a) contacting a first portion of said divided regenerated catalyst recylce stream with said hydrocarbonaceous feedstock in said reactor riser at a flow rate of said first portion of regenerated catalyst responsive to a first temperature determined within said reactor riser intermediate said first portion of catalyst admixture with said hydrocarbonaceous feedstock and entry of a second portion of said regenerated catalyst; and

(b) contacting a second portion of said regenerated catalyst with said admixture comprising said feedstock and said first portion of regenerated catalyst in said reactor riser at a flow rate of said second portion of regenerated catalyst responsive to a second temperature determined within said hydrocarbon reaction zone situated downstream of said reactor riser containing said first temperature determination point and both said first and second regenerated catalyst recycle entry points.

4,234,412
PROCESS FOR UPGRADING OF FISCHER-TROPSCH PRODUCTS

Michael A. M. Boersma, and Swan T. Sie, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 15, 1979, Ser. No. 39,247
Claims priority, application Netherlands, May 22, 1978, 7805494
Int. Cl.³ C10G 59/06
U.S. Cl. 208—80 **8 Claims**

1. A process for upgrading a Fischer-Tropsch hydrocarbon synthesis reaction product which comprises:

Separating from said reaction product at least:

(a) a light fraction consisting substantially of gaseous and/or liquid components boiling at a temperature below about 250° C., and

(b) a heavy fraction, a major portion of which has an atmospheric boiling point above 200° C.; and

Contacting at least one of said light and heavy fractions at a temperature in the range from about 200° to about 550° C., a pressure below 100 bar and a space velocity in the range from about 0.1 to about 50 liters per liter per hour with a catalyst containing a crystalline silicate which

(i) is thermally stable to temperatures above 600° C.,

(ii) after dehydration at 400° C. in vacuum, is capable of adsorbing more than 3%w water at 25° C. and saturated water vapor pressure, and

(iii) in dehydrated form, has the following overall composition, expressed in moles of the oxides:

$(1.0\pm0.3)\ (R)_{2/n}O.[a\ Fe_2O_3.b.Al_2O_3.cGa_2O_3].\ y(d\ SiO_2.eGeO_2O)$, where:

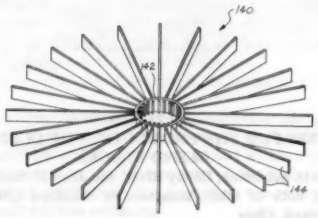
R=one or more mono or bivalent cations,
a>0.5
b≧0
c≧0,
a+b+c=1,
y=10−600,
d≧0.1,
e≧0,
d+e=1, and
n=the valency of R,

whereby in the case of said light, an aromatic gasoline product is obtained and in the case of said heavy fraction, a fuel oil product having a lower pour point than that of said heavy fraction is obtained.

4,234,413
METHOD AND APPARATUS FOR SELF-CLEANING DRILLING MUD SEPARATION SYSTEM

Don D. Summers, P.O. Box 30179, Lafayette, La. 70503

Continuation-in-part of Ser. No. 863,475, Dec. 23, 1977, Pat. No. 4,152,253. This application Feb. 1, 1979, Ser. No. 8,751
Int. Cl.³ B03B 7/00
U.S. Cl. 209—17 **3 Claims**



1. In a system for separating drill solids from drilling mud comprising a frame, a support base, a means for imparting vibration to said system, a separator vessel and a self cleaning screen assembly comprising separator screen and a lower support device, the improvement comprising

an assemblible screen cleaning device for use with said screen assembly, said device comprising:

(1) A central member having a plurality of slots therein, each for receiving an elongated screen cleaning member;

(2) a plurality of elongated screen cleaning members, one of each of which is loosely inserted into 1 of each of said slots in said central member for enabling freedom of movement, each of said members extending radially outwardly and forming a plane with said central member; and

(3) said screen cleaning device being positioned between said lower support device and said separator screen, for continually wiping, unclogging and cleaning said separator screen as said screen cleaning device vibrates vertically and rotates about said vibration imparting means in said plane.

4,234,414
PHOSPHATE BENEFICIATION PROCESS

Robert E. Hefner, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 28, 1978, Ser. No. 946,487
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—166 **7 Claims**

1. In a process for beneficiating a siliceous phosphate ore by froth flotation with a collector system for the flotation of siliceous matter, wherein fuel oil is present during flotation as an adjuvant to the collector, the improvement wherein the collector system comprises an enhancing amount of a condensate or an acid salt of a condensate of a polyethylene polyamine corresponding to the formula

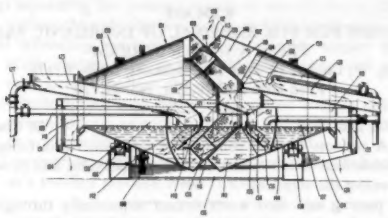
$$H_2N—C_2H_4NH—_xC_2H_4—NH_2$$

wherein x is an integer of 4 to 11, with a tall oil fatty acid or tall oil fatty acid ester.

4,234,415
APPARATUS FOR SEPARATING SOLIDS

Enrique de Tuya Casuso, Juan de Badajoz, 11-2°, IZQ, Leon, Spain

Filed Feb. 12, 1979, Ser. No. 11,638
Int. Cl.[3] B03B *5/42*
U.S. Cl. 209—172.5 **37 Claims**



1. Apparatus for separating mixed solids of two different specific gravities by means of a liquid medium having a specific gravity between said two specific gravities, comprising:

rotatable means defining a frustro-conical separation chamber, said chamber having a lighter solid outlet at one end defining the liquid medium level in said chamber and a heavier solid outlet at the other end; and said chamber having its least cross section adjacent said lighter solid outlet;

transverse wall means stationarily mounted in said separation chamber for dividing a lower portion of said separation chamber into a lighter solid zone and a heavier solid zone, said wall means having a substantially arcuate lower surface complementary with, and adjacent, the surface of said frustro-conical separation chamber at least the outer ends of said wall means being positioned between the minimum and maximum cross sections of said frustro-conical separation chamber;

means for supplying the mixed solids and liquid medium to said chamber, said liquid medium overflowing through said lighter solid outlet;

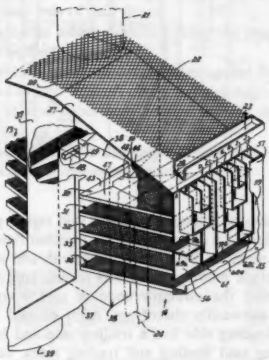
means at least in said arcuate lower surface for passage of solids through said wall means;

means for removing solids accumulating in said heavier solid zone through said heavier solid outlet.

4,234,416
FEED STREAM SPLITTER FOR MULTIPLE DECK SCREENING MACHINE

William E. Lower, Cincinnati; Stephen C. Mitchell, West Chester, and Jeremy F. Simpson, Cincinnati, all of Ohio, assignors to Rotex, Inc., Cincinnati, Ohio

Filed Aug. 23, 1979, Ser. No. 68,908
Int. Cl.[3] B07B *1/28*
U.S. Cl. 209—247 **11 Claims**



1. In a multiple deck screening machine wherein particulate material to be screened falls into a series of chutes which divide it into fractions and direct the respective fractions onto screens in a stack,

a feed splitter comprising,

a series of vertically extending dividers positioned in the path of the falling particulate material, the dividers defining channels between them, the dividers dividing the falling material into separate fractions as it falls into the respective channels,

each channel leading downwardly to a separate chute which directs the respective fraction from the channel onto a screen of the stack, the chutes being at different vertical positions according to the vertical positions of the screens to which they lead,

the lower chutes including portions extending laterally from their respective channels into the areas below upper chutes, to provide flow areas which are wider than the respective channels which feed them, thereby providing wider entrances onto the respective screens.

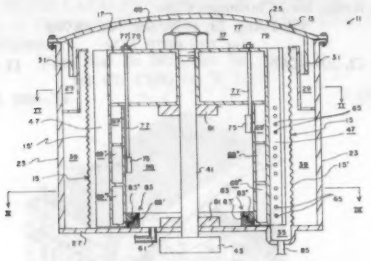
4,234,417
FIBROUS STOCK SCREEN

W. Thomas Gauld, and Eigild S. Thomsen, both of Mobile, Ala., assignors to Gauld Equipment Manufacturing Co., Theodore, Ala.

Filed Mar. 29, 1979, Ser. No. 25,285
Int. Cl.[3] B07B *1/20*
U.S. Cl. 209—306 **12 Claims**

7. An improved apparatus for screening fibrous stock of the type including a hollow housing member having an inlet port

for allowing fibrous stock to be introduced into the interior thereof and having an outlet port for allowing screened fibrous stock to be discharged therefrom; a cylindrical, open ended screen member positioned within said housing member; said housing member including structure means for fixedly mounting said screen member within said housing member and for isolating the outer side of said screen member to divide the interior of said housing member into a first chamber and a second chamber with the boundary between said first and second chambers defined in part by said screen member, said inlet port communicating directly with said first chamber and said outlet port communicating directly with said second chamber; a rotatable shaft member located substantially along the longitudinal axis of said screen member; wherein the improvement comprises: a rotor means for causing fibrous stock within said first chamber to pass through said screen member



into said second chamber and out said outlet port, said rotor means including a cylindrical body member fixedly attached to said shaft member for rotation therewith and including a plurality of blade members attached to and spaced substantially evenly about the circumference of said body member and radiating outwardly therefrom, each of said bade members having a leading side and a trailing side and having an outer side joining said leading and trailing sides, said leading and trailing sides being parallel to one another, said outer side having a leading portion that is substantially perpendicular to said leading and trailing sides and having a trailing portion that slopes inwardly toward said body member, the intersection between said leading side and said outer side being farther from said body member than the intersection between said trailing side and and said outer side being spaced from said screen member to permit forming of a mat of stock between said blade member and said screen member.

4,234,418

DIP-HANDLING APPARATUS

Claude M. Boissicat, Sunnyvale, Calif., assignor to Contrel Corporation, Sunnyvale, Calif.

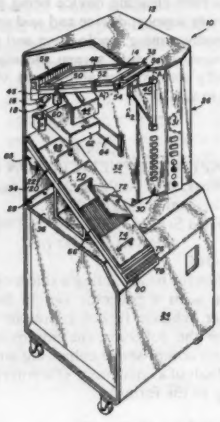
Filed Jun. 23, 1978, Ser. No. 918,609
Int. Cl.[2] B07C *5/344*
U.S. Cl. 209—542 **20 Claims**

1. A DIP-handling apparatus comprising:

input tray means having at least one input track disposed to lie in an inclined plane and for receiving DIPs at one end of said tray means in a first particular disposition relative to said track and for discharging said DIPs at the other end thereof;

test station means having a test track lying in a vertical plane intersecting said inclined plane and adapted to receive a DIP to be tested, and including test means for engaging said DIP as it is passed along said test track and for performing diagnostic tests thereupon;

metering and reorienting means disposed between said input tray means and said test station means and including a rotating member having a recess for receiving a DIP discharged from said input tray, and means for rotating said member about an axis bisecting an intersecting angle of said inclined plane and said vertical plane, said member being rotated between a DIP receiving position, wherein said recess is aligned to receive a DIP discharged from said input tray means, and a DIP discharging position, wherein said recess is aligned with said test track, whereby a DIP carried in said recess between said receiving position and said discharging position is reoriented such that the end thereof that first entered said recess at said receiving position is the last to leave the recess at said discharging position and such that the DIP is discharged



onto said test track with a second particular disposition relative thereto;

output tray means having a plurality of DIP sorting tracks;

shuttle means for receiving a tested DIP discharged from said test track and for depositing it onto one of the DIP sorting tracks of said output tray means; and

means responsive to a signal developed by said test means and operative to cause said shuttle means to deposit the tested DIP onto a particular one of said DIP sorting tracks.

4,234,419

PROCESS FOR THE REMOVAL OF INORGANIC SALTS FROM A WATER STREAM

Dudley W. Coillet, 12 Ross Rd., Belmont, Mass. 02178

Filed Oct. 9, 1979, Ser. No. 82,725
Int. Cl.[3] C02F *1/42*
U.S. Cl. 210—664 **20 Claims**

1. A process for the removal of inorganic salts from an unpotable feed water stream containing said salts, said process comprising the steps of:

(a) passing said feed water stream sequentially through at least two ion exchange beds, one of which is in the anion form and the other of which is in the cation form, to remove a significant portion of the anions and cations in the stream, and to form a filtrate stream,

(b) regenerating at least a portion of the anion exchange bed by passing an aqueous sodium ion-containing regenerant stream through the anion exchange bed portion while step (a) is discontinued with respect to it, to form a spent anion exchange regenerant stream, including ions from said unpotable water previously retained in said anion exchange bed,

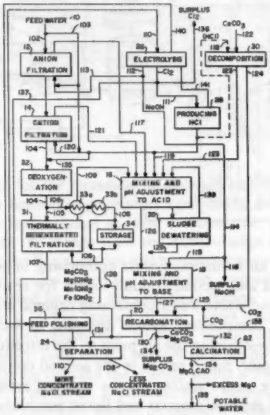
(c) regenerating at least a portion of the cation exchange bed by passing an aqueous chloride ion-containing regenerant stream through the cation exchange bed portion while step (a) is discontinued with respect to it to form a spent cation exchange regenerant stream including ions from

said unpotable water previously retained in said cation exchange bed.

(d) mixing said spent anion and cation exchange regenerant streams together with an acidifying agent in the presence of soluble calcium ion to precipitate a calcium salt of at least one anion selected from the group consisting of sulfate, phosphate, silicate and fluoride, in the spent anion exchange regenerant stream, the amount of said soluble calcium being maintained in excess of equivalency to the sum of the sulphate, phosphate, silicate and fluoride remaining in said spent regenerant stream,

(e) separating the product stream of step (d) into a precipitate portion and a soluble regenerant stream portion,

(f) mixing said soluble regenerant stream portion from step (e) with a causticizing agent in the presence of carbonate



ion to precipitate at least one cation selected from the group consisting of calcium, magnesium, ferrous or manganous, in the insoluble hydroxide or carbonate form, the amount of the said carbonate being maintained in excess of equivalency to the sum of the said calcium, magnesium, ferrous and manganous cations,

(g) separating the product stream of step (f) into a soluble sodium chloride solution stream and a precipitate portion,

(h) separating the soluble sodium chloride stream into a more concentrated sodium chloride stream and a less concentrated sodium chloride stream,

(i) electrolyzing said more concentrated sodium chloride stream to form an aqueous sodium hydroxide stream, and an aqueous hydrochloric acid stream, and

(j) recovering said less concentrated sodium chloride stream as a purified product water stream.

4,234,420

METHOD AND APPARATUS FOR POLLUTANT SPILL CONTROL

Joseph E. Turbeville, 4303 Jetton, Tampa, Fla. 33609

Continuation of Ser. No. 792,583, May 2, 1977, abandoned. This application May 3, 1979, Ser. No. 35,681

Int. Cl.[2] **B01D** *15/06;* **B03C** *1/30*

U.S. Cl. 210—671 **19 Claims**

1. A surface going aquatic vessel for the distribution, collection, treatment and redistribution of resilient sorbent particles in the collection of a liquid pollutant dispersed on the surface of an aquatic medium, said vessel comprising the following components:

a. a pollutant storage tank

b. a rotatably mounted cylindrical drum with its axis of rotation substantially normal to the direction of travel of said vessel and positioned such that the lowermost portion of said drum is immersed in said aquatic medium;

c. means for rotating said drum about its axis;

d. a plurality of circular magnetic bands mounted on the cylindrical surface of said drum in parallel spaced relation to each other, each of said bands defining a plane substantially normal to said axis of said drum;

e. means for wiping said cylindrical surface of said drum, comprising (1) a wiper blade extending along the length of said drum immediately adjacent the surfaces of said magnetic bands and positioned forward of the axis of said drum, and (2) a take-off chute extending forwardly and downwardly from said wiper blade;

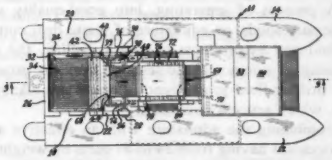
f. means for momentarily compressing resilient sorbent particles

g. a storage and distribution hopper having a lowermost portion spaced above the aquatic medium, and an uppermost portion for receiving resilient sorbent particles and positioned forward of said compressing means, said lowermost portion including an elongated opening substantially parallel to said axis of said drum;

h. particle discharge means mounted along the length of said elongated opening;

i. conveying means communicating from a point beneath the forward end of said take-off chute through said compressing means to said uppermost portion of said distribution hopper;

j. means for actuating said discharge means, said conveying means, and said compressing means;



k. an elongated pollutant sump comprising a drain chute coextensive with and positioned beneath said conveying means and terminating in a drain sump;

l. a pollutant conduit communicationg said drain sump with said pollulant storage tank; and

m. means for propelling said vessel along the surface of said aquatic body.

13. A continuous method for the collection and recovery of liquid pollutant floating on the surface of an aquatic medium comprising the steps of:

a. distributing buoyant, magnetically susceptible, oleophillic, resilient sorbent particles on the surface of said liquid pollutant;

b. providing a sorbent-pollutant contact time sufficient for the sorbent to attract and sorb a portion of the liquid pollutant;

c. magnetically collecting the pollutant-containing sorbent particles;

d. passing said particles through a compression zone to expel the majority of said pollutant

e. collecting said expelled pollutant

f. allowing said compressed sorbent particles to expand to recover at least a portion of their original uncompressed volume;

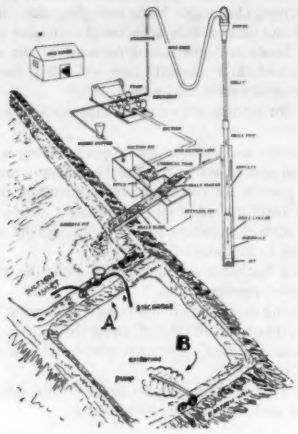
g. redistributing said sorbent particles on the surface of the remaining pollutant; and

h. repeating the steps of providing, magnetically collecting, passing, collecting, allowing and redistributing for a number of cycles sufficient to to collect and recover said liquid pollutant.

4,234,421
LAND RESTORATION FOLLOWING OIL-WELL DRILLING

Virgil L. Dover, Jr., 501 Marie Antoinette St., Lafayette, La. 70506

Filed Mar. 5, 1979, Ser. No. 17,558
Int. Cl.[3] C02F 1/56
U.S. Cl. 210—728 1 Claim



1. A process of separating, into good-quality water and high-density solids, an admixture of waste drill cuttings, drilling fluid and by-products of rotary drilling, the admixture containing an anionic colloid selected from the group consisting of drilling-fluid grade lignosulfonate and alkaline-soluble lignite, which process comprises:

(a) combining the admixture with an effective amount of flocculant having from 24 to 49 parts by weight of aluminum sulfate per part by weight of polyacrylamide homopolymer having from 130 to 300 pendant amide groups per pendant carboxylic-acid or carboxylic-acid-salt group and with a molecular weight in the range of from 10,000 to 5 million, to flocculate solids in said admixture

(b) aerating the product obtained by step (a)

(c) separating water from the flocculated solids.

4,234,422
PROCESS FOR REMOVAL OF MERCURY AND MERCURY COMPOUNDS FROM AQUEOUS SOLUTIONS AND INDUSTRIAL WASTE LIQUORS

Egon Falbesaner, Burghausen, Fed. Rep. of Germany; Josef Bichler, Duttendorf, Austria, and Eberhard Wimmer, Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

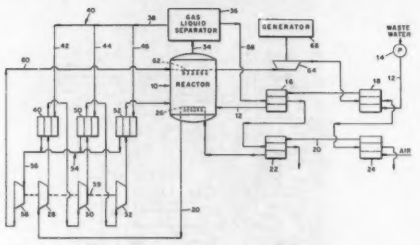
Filed Apr. 30, 1979, Ser. No. 34,314
Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2819153
Int. Cl.[3] C02F 1/70
U.S. Cl. 210—713 5 Claims

1. A process for the removal of mercury and mercury compounds from aqueous solutions, particularly industrial waste liquors, by reduction and filtration, wherein after reduction the liquors are cleared by letting the mercury particles and dirt particles flow into a settling basin, and subsequently subjecting the supernatant aqueous solution from the settling basin to a single depth filtration through a deep filter containing a filtering medium consisting essentially of sand having a grain size of 0.02 mm to 2 mm, whereupon the mercury is returned to the settling basin by reverse rinsing of the filter and is deposited in the settling basin for final removal, the mercury residues remaining in the single and final filtrate amounting to less than 0.05 mg/liter liquor.

4,234,423
ENERGY RECOVERY SYSTEM

Albert S. Moore, and Francis H. Verhoff, both of Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 30, 1979, Ser. No. 25,639
Int. Cl.[3] C02F 1/74, 11/08
U.S. Cl. 210—758 6 Claims



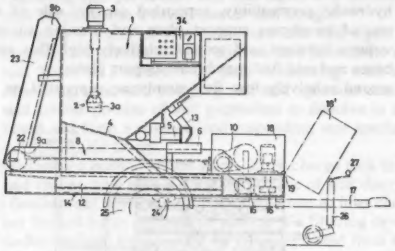
1. A wet air oxidation system comprising in combination, a reactor, first and second conduit means for respectively conveying air and waste water containing organic matter into said reactor, air compressing means disposed in the first conduit means for pressurizing the air prior to the introduction thereof into the reactor, pump means in the second conduit means for pumping the waste water into the reactor, separating means arranged to receive gaseous and liquid products of wet combustion from the reactor and adapted to separate said gaseous and liquid products into separate streams, first heat exchange means disposed in said reactor for heating the air in the first conduit means to substantially the reaction temperature prior to the air entering the air compressing means, second heat exchange means coupled to said first conduit at a location downstream of at least a portion of the air compressing means, further conduit means coupled to said second heat exchange means and to said separating means for conveying the gaseous stream therefrom through said second heat exchange means to extract heat from the compressed air, and prime mover means disposed downstream of and coupled to the second heat exchange means and adapted to be driven by the heated gaseous stream.

5. An improved wet air oxidation method for reducing the chemical oxygen demand of organic matter in waste water while simultaneously recovering energy in excess of that required for practicing the method, comprising the steps of pumping the waste water into a reactor, providing the reactor with a volume of air sufficient to support wet combustion of the organic matter at a temperature in the range of about 450° to 600° F. and at a pressure in the range of about 500 to 1800 psig, pressurizing the air to a pressure at least as great as that in the reactor, separating gaseous and liquid products of combustion from the reactor into separate streams, directing the gaseous stream into prime mover means for the operation thereof; the improvement comprising the steps of heating the air to a temperature substantially equal to that present in the reactor prior to the pressurization thereof, further heating the air to a temperature substantially greater than that present in the reactor during the pressurization thereof, and heating the gaseous stream with the further heated air to a temperature greater than that of the gaseous stream exiting the reactor prior to the introduction of the gaseous stream into the prime mover.

4,234,424
APPARATUS FOR THE PURIFICATION OF OILY EMULSIONS, SOLUTIONS, AND INDUSTRIAL WASTE WATERS

Ralf F. Piepho, Deisterstr. 58, 5015 Wennigsen, BRD, Fed. Rep. of Germany

Continuation of Ser. No. 827,250, Aug. 28, 1977, abandoned. This application Aug. 25, 1978, Ser. No. 936,706
Int. Cl.[2] B01D *33/32*
U.S. Cl. 210—771 2 Claims



1. A method for the treatment, separation and air drying of sludge from a liquid-sludge mixture comprising the steps of:

treating the liquid-sludge mixture in a container means so as to separate the sludge from the liquid-sludge mixture;

discharging the liquid-sludge mixture under gravity from the container means into an elongated spreading trough means located beneath the container means;

discharging a lateral spread of the liquid-sludge mixture under gravity from the laterally elongated spreading trough means onto only a portion of a napped filter strip that is moving beneath the trough means while resting on the upper course of a continuously moving conveyor means, the conveyor means including a moving, endless, foraminous conveyor belt trained over laterally spaced rollers, thereby providing the upper, elongated belt course adapted to move from a first end toward a discharge end and a lower elongated belt course, below said upper belt course, adapted to return from said discharge end to said first end;

removing the liquid component of the liquid-sludge mixture by permitting said liquid component to pass by gravity through the filter strip and foraminous conveyor belt courses to expose the liquid-sludge residue to air for a substantial portion of the elongated belt course so as to provide a substantially dry sludge residue by the time the moving filter strip reaches the discharge end of the upper belt course;

receiving in an elongated filtrate-receiving container, positioned to lie beneath the lower course of said endless belt, filtrate that has passed through the filter strip and through both courses of the foraminous conveyor belt; and

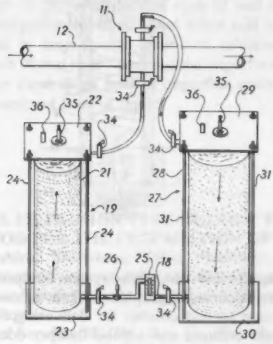
discharging the filter strip with dried sludge residue thereon from the discharge end of the upper course of the endless belt as the endless belt completes its transport of the filter strip along the upper course of the belt.

4,234,425
FLUORIDATION SYSTEM

John N. Leo, 9101 Hannett, NE., Albuquerque, N. Mex. 87112

Filed Apr. 23, 1979, Ser. No. 32,396
Int. Cl.[3] B01J *8/04*
U.S. Cl. 210—88 5 Claims

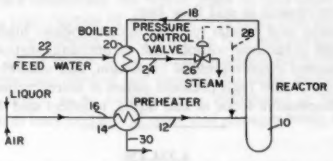
1. A fluoridation system including a venturi inserted into a water line along the length thereof, said venturi including a throughbore having a diminishing tapered section followed by an increasing tapered section in the direction of liquid flow, a passage intersecting said throughbore and extending substantially perpendicularly thereto, means associated with said venturi for withdrawing water from said water line, a first conduit means including an inlet end for transferring water from said withdrawing means to and through a chamber containing a water softening material for softening the water passing through said first conduit means, flow rate measuring means in said first conduit means, flow control means in said first conduit means, said first conduit means including an outlet end connected to a fluoride chamber containing a water-soluble fluoride salt, said outlet end of said first conduit means being connected adjacent the bottom of said fluoride chamber, a second conduit means connected adjacent the top of said fluoride chamber, said second conduit means connecting said fluoride chamber with said passage of said venturi which is substantially perpendicular to said throughbore thereof, flow control means in said second conduit means, said fluoride chamber including a transparent portion for inspection of the contents thereof.



4,234,426
WET COMBUSTION SYSTEM INCORPORATING AUTOREGULATION

Allan R. Wilhelmi, Wausau, Wis., and Daniel C. Troy, Litchfield, N.H., assignors to Sterling Drug Inc., New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,553
Int. Cl.[3] C02F *1/72*
U.S. Cl. 210—149 3 Claims



1. A wet combustion system comprising a reactor to oxidize an influent liquor admixed with an oxygen containing gas, a boiler, an effluent line from the reactor, said effluent line leading to the boiler, the latter cooling the reactor effluent in part, a process stream, means to heat said process stream by recovering residual energy from said partially cooled reactor effluent, said process stream leading to said heating means, an effluent line from the boiler to said heating means, a feed water source for the boiler, an exit line from the boiler for steam generated therein, a pressure control valve in the exit line, means sensing the temperature of the process stream, said means being coupled to and regulating the pressure control valve, and means to autoregulate the amount of heat extracted by the boiler.

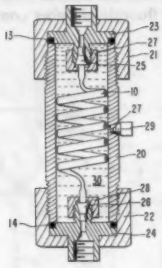
4,234,427
PULSE DAMPER

Detlef R. Boehme, Walnut Creek, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 911,853, Jun. 2, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 45,033

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—198 C **16 Claims**



1. In a liquid chromatography system comprising a reciprocating pump, a chromatographic column, a flow line connecting said pump to said column for delivering fluid from said pump to said column, and a pulse damper coupled into said flow line for damping high pressure pulsations in said flow line, said pulse damper comprising:

a flexible tubular member in series with said flow line;

a liquid-tight housing structure surrounding said tubular member, said structure being completely filled with a compressible liquid;

said tubular member having a first flattened non-circular cross-sectional configuration in the absencr of said pulsations, said member being capable, upon occurrence of a high pressure pulsation, of assuming a second cross-sectional configuration of area greater than said first configuration of area greater than said first configuration, with the circumference of said tubular member experiencing minimal expansion;

said tubular member in said second cross-sectional configuration displacing an additional differential displacement volume dV as compared to the original volume displaced by said member in said first configuration;

the volume V and compressibility X of said compressible liquid being related to said differential volume dV such that dV/XV is greater than the highest anticipated pressure change in said flow line;

whereby said tubular member accommodates high pressure fluid pulsations without risk of bursting, sustaining only minimal circumferential expansion, and whereby the energy of said high pressure pulses is stored primarily as a compressive force in said liquid, to effect said damping.

4,234,428
DUAL MEMBRANE MASS TRANSFER DEVICE

William J. Schnell, Wheeling, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 12, 1978, Ser. No. 950,535

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—321 B **9 Claims**

1. In an apparatus for the treatment of blood by hemodialysis, having a stack of membrane support plates which support membranes on opposite sides therof and form open volumes between the membrane support plates and the membranes supported thereon, the improvement comprising, in combination:

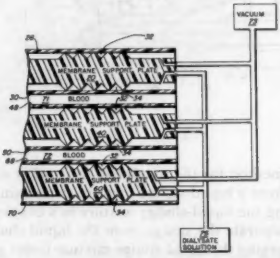
a first membrane support plate; a first relatively high flux membrane, with relatively high hydraulic permeability, supported on one side of said first membrane support plate and forming an open volume between said first relatively high flux membrane and said first membrane support plate;

a first relatively low flux membrane supported on the opposite side of said first membrane support and forming an open volume between said first relatively low flux membrane and said first membrane support plate;

a second membrane support plate spaced from said first membrane support plate, with a blood path formed in the spacing between said first and second membrane support plates;

a second relatively high flux membrane, with relatively high hydraulic permeability, supported on one side of said second membrane support plate and forming an open volume between said second relatively high flux membrane and said first membrane support plate;

a second relatively low flux membrane supported on the



opposite side of said second membrane support plate and forming an open volume between said second relatively low flux membrane and said second membrane support plate;

said open volume between said relatively high flux membranes and the respective membrane support plates comprising a low pressure path to provide significant ultrafiltration;

said open volume between said relatively low flux membranes and the respective membrane support plates comprising a dialysate solution path to provide significant dialysis and relatively insignificant ultrafiltration; and

said membrane support plates segregating said open volume between said relatively high flux membranes and the respective membrane support plates from said open volume between said relatively low flux membranes and the membrane support plates.

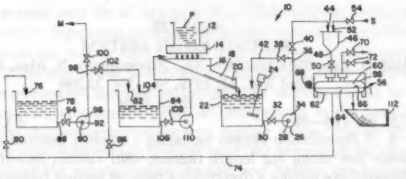
4,234,429
SYSTEM FOR SEPARATING PARTICULATE MATTER INTO SOLUBLE AND INSOLUBLE PORTIONS

Cecil C. Rhodes, Farmington Hills, and Robert S. Kozar, Livonia, both of Mich., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Feb. 26, 1979, Ser. No. 15,455

Int. Cl.² B01D *37/00*

U.S. Cl. 423—109 **4 Claims**



1. A method of separating portions of particulate matter

collected pursuant to environmental air quality control requirements so that said particulate matter may be more readily disposed of, said particulate matter comprising a soluble chloride portion and an insoluble metallic oxide portion, said method comprising the steps of:

(1) dispensing a controlled amount of said particulate matter over a substantial area forming an upper end of an inclined trough receiving a controlled volume of a flow of a dissolving liquid comprising substantially water wherein said particulate may be wetted by said liquid,

(2) agitating said particulate and said liquid in a dissolving tank connected to a lower end of said trough,

(3) forming a slurry of said particulate and said liquid by pumping for proximately 10 minutes said particulate and said liquid in a closed loop path connecting with said dissolving tank, said pumping and said agitation causing said soluble portion of said particulate to dissolve in said liquid and form a solution and suspending said insoluble portion in said slurry,

(4) pumping a portion of said slurry into a charge tank to fill said charge tank with a selective volume of said slurry,

(5) flowing said slurry in said charge tank into an inlet chamber formed by an upper shell portion of a filtering device further defined by an outlet chamber separated from said inlet chamber by a horizontally disposed section of filter media,

(6) applying sufficient air pressure to said inlet chamber of said filter device to cause said solution to flow through said filter media and said insoluble portion to collect on said media to form a continuous passage-free cake thereon without said air flowing through said cake,

(7) sensing a drop in said air pressure upon a substantial amount of said solution having flowed to said outlet chamber,

(8) activating venting means to decrease said air pressure in said inlet chamber to an ambient value upon sensing said pressure drop,

(9) filling said charge tank with a selective volume of a rinsing liquid, said rinsing liquid volume being proximately one-half of said slurry volume,

(10) flowing said rinsing liquid in said charge tank into said inlet chamber of said filter device,

(11) applying sufficient air pressure to said inlet chamber to cause said rinsing liquid to flow through said cake and said filter media to rinse said continuous passage-free cake and remove any further residue of said solution entrapped in said cake,

(12) sensing a drop in said air pressure upon a substantial amount of said rinse liquid having flowed to said outlet chamber, and activating a timing device thereupon, (13) flowing air through said cake to dry said cake for a selective time period as regulated by said timing device, and

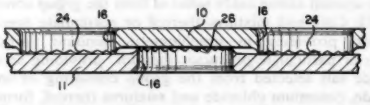
(14) lifting said upper shell portion of said filter device from said section of filter media to allow said section of filter media and said cake carried thereon to be indexed from said filter device and be disposed of accordingly.

4,234,430

FILTERING SEPTUM

George J. Peer, Mt. Kisco, N.Y., and Robert C. Bradley, Paramus, N.J., assignors to Multi-Metal Wire Cloth Inc., Tappan, N.Y.

Filed Mar. 1, 1979, Ser. No. 16,420
Int. Cl.[2] B01D *25/18*
U.S. Cl. 210—489 **5 Claims**



1. In a filtering septum of the type having a single pair of metal sheets in superposed contacting relation, each sheet having a multiplicity of perforations therein, the perforations in each of said sheets being of like generally uniform diameter and arranged in the same spatial pattern, said pattern being such that adjacent each perforation there is an unperforated area larger than said perforation, said superposed sheets arranged in a relationship in which the perforations of one sheet are completely out of registry with those of the other sheet, the improvement wherein both of said metal sheets comprise:

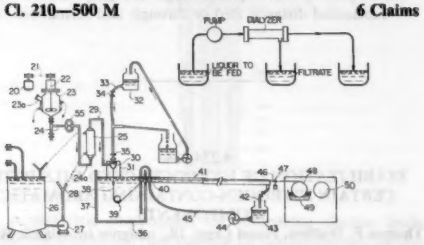
marginal burrs on the inner face of each of said sheets defined by said perforations such that when said two sheets are secured in inner-face-to-inner-face relationship, the burrs of each of said sheets bear against unperforated areas of the other sheet along lines of imperfect contact pervious to a restricted flow of liquid.

4,234,431

MEMBRANE FILTRATION TYPE HOLLOW FIBERS AND METHOD FOR THE PREPARATION OF SAME

Mashahiro Mishiro, Moriyama; Tokio Nishikawa, Hikone; Shigeyasu Ohashi, Moriyama, and Yasuo Yokokawa, Tanashi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 657,346, Feb. 11, 1976, abandoned.
This application Sep. 7, 1977, Ser. No. 831,198
Claims priority, application Japan, Feb. 15, 1975, 50-18426
Int. Cl.[3] B01D *13/04, 31/00*
U.S. Cl. 210—500 M **6 Claims**



1. A cellulose acetate membrane filtration type hollow fiber comprised of a single material phase, wherein the cylindrical wall defining said hollow fiber represents a three-dimensional net-like structure of fine filtering passages of 0.01 to 1 micron, said structure occupying the whole mass of said wall when seen in any cross-section of said wall, providing thus on effective and active filtering zone, the pore rate amounting to at least 55%, active points of the filtering passages for governing minimum passable sizes of said passages for solids included in a filtering liquor to be treated being distributed at random throughout at least said active zone, said passages being nearly uniform.

4,234,432

POWDER DISSEMINATION COMPOSITION

William B. Tarpley, Jr., West Chester, Pa., assignor to Energy and Minerals Research Co., Kennett Square, Pa.

Filed Oct. 26, 1977, Ser. No. 845,683
Int. Cl.[3] A62D *1/00*
U.S. Cl. 252—8 **21 Claims**

1. A nonaqueous thixotropic composition of matter for use with disseminating apparatus comprising powder having at least a bimodal particle size distribution, a gelled liquid, the powder comprising about 30 to about 70 volume percent of the composition and being substantially insoluble in the gelled liquid.

4,234,433

RECOVERY OF PETROLEUM WITH CHEMICALLY TREATED HIGH MOLECULAR WEIGHT POLYMERS

John S. Rhudy, Littleton, and Connie L. Gibb, Evergreen, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 812,973, Jul. 5, 1977, abandoned. This application Oct. 4, 1978, Ser. No. 948,610
Int. Cl.[3] E21B *43/22*
U.S. Cl. 252—8.55 D 11 Claims

1. In a process of flooding an oil-bearing subterranean formation in communication with injection means and production means, wherein an aqueous, high molecular weight polymer solution is injected into the formation to displace oil toward the producing means, the improvement comprising:

(a) reacting in an aqueous solution a polymer-oxidizing oxidant selected from the group consisting of peroxides and compounds of the formula MOX wherein M is an alkali metal or ammonium and X is a halogen with a polymer of average molecular weight sufficiently high to cause substantial plugging of the reservoir on injection in aqueous solution to reduce the polymer to an average molecular weight which does not cause substantial plugging during injection into the reservoir,

(b) thereafter reacting a reducing agent with the polymer of reduced average molecular weight to terminate degradation by the oxidant at a predetermined average molecular weight,

(c) injecting an aqueous solution of the degraded polymer into the reservoir through the injection means, and

(d) displacing said aqueous degraded polymer solution a substantial distance into or through said formation.

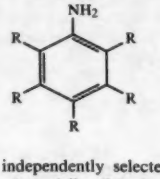
4,234,434

STABILIZATION OF HYDROCRACKED OILS WITH CERTAIN NITROGEN-CONTAINING AROMATIC COMPONENTS

Thomas F. Wulfers, Hazel Crest, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

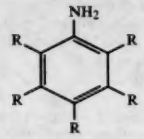
Filed Feb. 14, 1979, Ser. No. 11,839
Int. Cl.[2] C10M *1/34*
U.S. Cl. 252—50 12 Claims

1. A composition of matter comprising a major amount by weight of a hydrocracked lubricating oil and a minor amount by weight of at least one added nitrogen-containing aromatic component having a structure:



wherein such R is independently selected from the group consisting of H and substantially aliphatic monovalent hydrocarbonaceous radicals containing 1 to about 24 carbon atoms such that two of said R's are substantially aliphatic monovalent hydrocarbonaceous radicals; said nitrogen-containing aromatic component being present in an amount effective to reduce the susceptibility to sunlight deterioration of said hydrocracked oil.

8. A method of inhibiting a hydrocracked lubricating oil from deterioration caused by sunlight comprising combining with said oil an inhibiting amount of at least one nitrogen-containing aromatic component having structure:



wherein each R is selected from the group consisting of H and substantially aliphatic monovalent hydrocarbonaceous radicals containing 1 to about 24 carbon atoms such that two of said R's are substantially aliphatic monovalent hydrocarbonaceous radicals.

4,234,435

NOVEL CARBOXYLIC ACID ACYLATING AGENTS, DERIVATIVES THEREOF, CONCENTRATE AND LUBRICANT COMPOSITIONS CONTAINING THE SAME, AND PROCESSES FOR THEIR PREPARATION

Norman A. Meinhardt, Lyndhurst, and Kirk E. Davis, Euclid, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 772,161, Feb. 25, 1977, abandoned. This application Feb. 23, 1979, Ser. No. 14,510
Int. Cl.[3] C10M *1/32*
U.S. Cl. 252—51.5 A 65 Claims

1. A lubricating composition comprising a major amount of oil of lubricating viscosity and a minor amount of one or more carboxylic derivative compositions produced by reacting at least one substituted succinic acylating agent with a reactant selected from the group consisting of (a) amine characterized by the presence within its structure of at least one H—N< group, (b) alcohol, (c) reactive metal or reactive metal compound, and (d) a combination of two or more of any of (a) through (c), the components of (d) being reacted with said one or more substituted succinic acylating agents simultaneously or sequentially in any order, wherein said substituted succinic acylating agents consist of substituent groups and succinic groups wherein the substituent groups are derived from polyalkene, said polyalkene being characterized by a Mn value of 1300 to about 5000 and a Mw/Mn value of about 1.5 to about 4, said acylating agents being characterized by the presence within their structure of an average of at least 1.3 succinic groups for each equivalent weight of substituent groups.

4,234,436

MOLTEN SALT SYNTHESIS OF MODIFIED ALKALI NIOBATE POWDERS

Ronald H. Arendt, and Joseph H. Rosolowski, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,912
Int. Cl.[3] C04B *35/00;* C01G *23/00*
U.S. Cl. 252—62.9 8 Claims

1. A process for producing a modified alkali niobate having the formula $(A_{2x}B_{1-x})Nb_2O_6$ wherein A is alkali atom selected from the group consisting of Na, K and mixtures thereof, B is cation selected from the group consisting of Pb, Cd and mixtures thereof, and x has a value ranging from an effective amount up to but less than 1, which consists essentially of providing in stoichiometric amount an alkali oxide selected from the group consisting of Na_2O, K_2O and mixtures thereof or particulate precursor therefor, providing in stoichiometric amount cation oxide selected from the group consisting of PbO, CdO and mixtures thereof or particulate precursor therefor, providing in stoichiometric amount particulate Nb_2O_5 or particulate precursor therefor, providing an alkali chloride salt selected from the group consisting of sodium chloride, potassium chloride and mixtures thereof, forming a mixture of said alkali oxide or precursor therefor, said cation oxide or precursor therefor, said Nb_2O_5 or precursor therefor

and said chloride salt solvent, said chloride salt being used in an amount of at least about 20% by weight of the total amount of said alkali oxide, cation oxide, Nb_2O_5 and chloride salt, heating said mixture to a reaction temperature at least sufficient to melt said chloride salt, each said precursor decomposing completely at or below said reaction temperature to form said oxide and by-product gas, said chloride salt in molten form being a solvent for said alkali oxide, cation oxide and Nb_2O_5, maintaining said reaction temperature dissolving and reacting said alkali oxide, cation oxide and Nb_2O_5 in said molten salt and precipitating said modified alkali niobate, and recovering said precipitated modified alkali niobate by dissolving said chloride salt and separating said precipitated modified alkali niobate from the resulting salt solution.

4,234,437

SUSPENSION OF SOLID PARTICLES IN A LIQUID

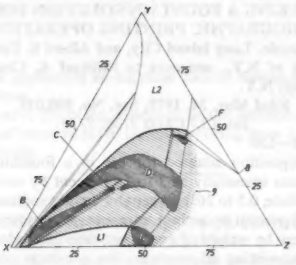
Stig E. Friberg, and Kelvin Roberts, both of Saltsjö-Boo, Sweden, assignors to Arbman Development AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 490,695, Jul. 22, 1974, abandoned, which is a continuation of Ser. No. 238,514, Mar. 27, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,709

Claims priority, application Sweden, Mar. 30, 1971, 4136/71

Int. Cl.³ C09D *5/02;* **H01F** *1/28*

U.S. Cl. 252—62.51 **7 Claims**



1. In a suspension of solid particles in an organic or aqueous liquid and a stabilizing agent, the improvement which comprises said stabilizing agent being a lyotropic liquid crystal.

4,234,438

MAGNETIC RECORDING MEDIUM

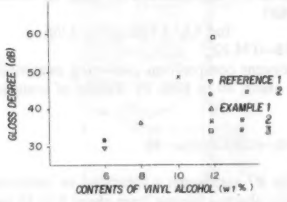
Eiji Horigome; Hiroshi Ota, and Hitoshi Azegami, all of Tokyo, Japan, assignors to TDK Electronics Company Limited, Tokyo, Japan

Filed May 10, 1979, Ser. No. 37,779

Claims priority, application Japan, May 18, 1978, 53/58299

Int. Cl.³ H01F *1/373;* **B05D** *5/12*

U.S. Cl. 252—62.54 **6 Claims**



1. A magnetic recording medium useful as a magnetic coating composition prepared by a process, comprising:

removing alcohol from an alcohol impregnated nitrocellulose composition;

impregnating said alcohol free nitrocellulose with a vinyl chloride-vinylacetate-vinylalcohol copolymer having a vinyl alcohol content of at least 8 wt.%;

blending a magnetic powder, a cross-linkable polymer and a solvent with the impregnated nitrocellulose; and

adding a cross-linking agent to said blended mixture.

4,234,439

DIELECTRIC MATERIAL FOR INFLUENCING ELECTRIC FIELDS, AND STRESS CONTROL DEVICES MADE THEREFROM

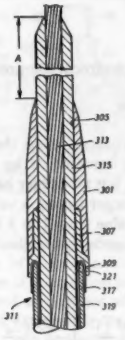
Dieter Kehr, and Juergen Goebell, both of Hamburg, Fed. Rep. of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 10, 1979, Ser. No. 37,669

Claims priority, application Fed. Rep. of Germany, May 12, 1978, 2821017

Int. Cl.³ H02G *15/02, 15/08;* **H01B** *17/64, 3/04*

U.S. Cl. 252—63.2 **8 Claims**



1. A dielectric composition for influencing electric fields comprising a dielectric base material having distributed therein electrically conductive platelet-shaped particles in an amount below a limit concentration at which the composition exhibits an electrical volume resistivity characteristic for insulating materials, and also distributed therein platelet-shaped particles of an insulating material different from said base material and having a higher electrical breakdown voltage than said base material, the number and size of said particles of insulating material being comparable with said platelet-shaped electrically conductive particles.

4,234,440

HYDROXYBENZOIC ACID AS PH BUFFER AND CORROSION INHIBITOR FOR ANTIFREEZE CONTAINING ORGANOSILICONE-SILICATE POLYMERS

Stanley T. Hirozawa, Birmingham, Mich.; Edward F. O'Brien, Cromwell, Conn., and Joe C. Wilson, Belleville, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 2, 1979, Ser. No. 349

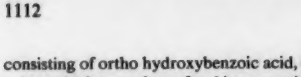
Int. Cl.² C09K *15/32*

U.S. Cl. 252—76 **7 Claims**

1. A single-phase antifreeze and coolant concentrate consisting essentially of an alcohol selected from the group consisting of methanol, ethanol, propanol, ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol and glycerol, an organosilicone-silicate polymer corrosion inhibitor and a hydroxybenzoic acid pH buffer and corrosion inhibitor composition capable of buffering the pH in the range of above about 9 to about 11, wherein said pH buffer is selected from the group

consisting of ortho hydroxybenzoic acid, para hydroxybenzoic acid, and mixtures thereof and is present in the amount of about 0.1 to about 1.5 percent by weight based upon the weight of said antifreeze, wherein said organo-silicone-silicate polymer corrosion inhibitor is present in an amount of 0.01 percent to 10 percent by weight of said concentrate, and wherein said polymer consists essentially of:

(A) from 10 to 90 parts by weight of siloxane groups represented by the formula:



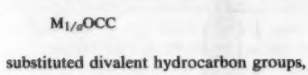
(I)

wherein M is a cation that forms a water-soluble silicate selected from the group consisting of the sodium, potassium, lithium, rubidium and tetra(alkyl)ammonium cations, a is the valence of the cation represented by M and is an integer having a value of at least one, R is a member selected from the group consisting of the unsubstituted divalent hydrocarbon groups,

substituted divalent hydrocarbon groups, each

is connected to the silicon atom through at least 2 carbon atoms of the group represented by R, R^1 is a monovalent hydrocarbon group, b is an integer having a value from 1 to 3 inclusive, c is an integer having a value from 0 to 2 inclusive and (b+c) have a value from 1 to 3 inclusive and

(B) from 10 to 90 parts by weight of groups represented by the formula:



(II)

wherein M and a have the above-defined meanings and d is an integer having a value from 1 to 3 inclusive, said parts by weight of said groups being based on 100 parts by weight of the organosilicone-silicate polymer.

4,234,441

SILICONE OIL COMPOSITIONS CONTAINING SILICATE CLUSTER COMPOUNDS

Robert N. Scott, Wallingford; David F. Gavin, Cheshire, and Frank J. Milnes, Guilford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 27, 1979, Ser. No. 33,767

Int. Cl.[3] **C09K** *5/00;* **C07F** *7/04, 7/18*

U.S. Cl. 252—78.3 **13 Claims**

1. A functional fluid composition comprising a silicone oil and an effective proportion of a silicate cluster compound selected from the group consisting of alkoxysilane cluster compounds, alkoxysilanol cluster compounds, halogenated alkoxysilane cluster compounds, alkoxysilane multiple cluster compounds, and silicone-bridged alkoxysilane cluster compounds.

4,234,442

FEED UNIT OF A DETERGENT COMPOSITION BASED ON ALKALI CARBONATE

Emery G. P. Cornelissens, Nootdorp, Netherlands, assignor to Akzo N.V., Netherlands

Filed Jul. 14, 1978, Ser. No. 924,551

Int. Cl.[2] **C11D** *7/08, 7/12, 17/00, 17/04*

U.S. Cl. 252—90 **7 Claims**

1. A sachet having two compartments containing a detergent composition comprising:

(a) 5–65 percent by weight of an alkali carbonate;

(b) 5–30 percent by weight of one or more solid acids which form water-soluble calcium salts and magnesium salts or complexes, the acids having a pK_1-value in the range of from 2.8 to 4.8;

(c) the remainder of the composition consisting of usual solid detergent constituents including surfactants and optionally including alkaline builders; the total amount of alkaline material being present in stoichiometric excess relative to the amount of the acid, the acid being present in one of the compartments and the alkaline constituents being present in the other compartment of the sachet, the compartment containing the acid releasing its contents when brought into water before the compartment containing the alkaline constituent releases its contents.

4,234,443

COMPOSITION AND A METHOD USEFUL FOR MAKING A FOUNTAIN SOLUTION FOR LITHOGRAPHIC PRINTING OPERATIONS

Ralph D. Canale, Long Island City, and Albert S. Canale, Bayside, both of N.Y., assignors to Michael A. Canale, Long Island City, N.Y.

Filed Mar. 24, 1978, Ser. No. 890,018

Int. Cl.[2] **C11D** *3/08, 7/16*

U.S. Cl. 252—135 **20 Claims**

1. A composition adapted for use in a fountain solution which consists essentially of 2 to 66 percent by weight trisodium phosphate; 0.5 to 26.0 percent by weight sodium metasilicate; 2 to 67 percent by weight tetrapotassium pyrophosphate; 2 to 25 percent by weight of a nonionic detergent selected from the group consisting of condensation products of ethylene oxide with dialkylphenols, the dialkyl moieties which are of from 2 to 20 carbon atoms, and of ethylene oxide with monohydric hydrocarbon alcohols of from 12 to 20 carbon atoms, the molar ratio of ethylene oxide units to each dialkylphenol unit or monohydric hydrocarbon alcohol unit in each said condensation product being of from 9:1 to 150:1; and 0.02 to 10.00 percent by weight dialkylpolysiloxane.

4,234,444

NONIONIC TENSIDE DETERGENT COMPOSITIONS

Ingo Wegener, Düsseldorf; Johann Glasl, Solingen, and Achim Werdehausen, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,542

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2829697

Int. Cl.[3] **C11D** *1/72, 1/66*

U.S. Cl. 252—174.22 **2 Claims**

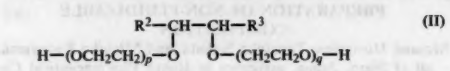
1. A detergent composition consisting essentially of

(a) from about 40 to 60% by weight of compounds of formula

$$R^1—O—(CH_2CH_2O)_n—H \quad (I)$$

wherein R^1 represents a saturated or unsaturated radical of a fatty alcohol having from about 6 to 18 carbon atoms, and n is an integer of from 4 to 15; and

(b) from about 60 to 40% by weight of compounds of formula



wherein R^2 and R^3 each independently represent an alkyl radical having from about 1 to 17 carbon atoms, the total number of carbon atoms in R^2 and R^3 being from about 8 to 18, and p and q each independently represent a number from 0 to 15, the sum of p plus q being from about 4 to 15.

4,234,445

POLYURETHANE SPRAY COMPOSITION CONTAINING LACTONE VISCOSITY MODIFIER

Edward L. Hagen, Woodbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 924,105, Jul. 12, 1978, Pat. No. 4,195,148. This application Jan. 25, 1979, Ser. No. 6,406

Int. Cl.³ C08G *18/12, 59/56, 59/62*

U.S. Cl. 252—182 **4 Claims**

1. A composition comprising a mixture of:

(b) curative for a polyurethane prepolymer which gives a tack-free time of 15 seconds to 5 minutes; and

(c) a lactone having the formula:

wherein R represents an alkylene radical having from 4 to 6 carbon atoms,

the curative (b) being dissolved in the lactone (c) and the ratio of curative (b) to lactone (c) being from 1:10 to 100:1, by weight.

4,234,446

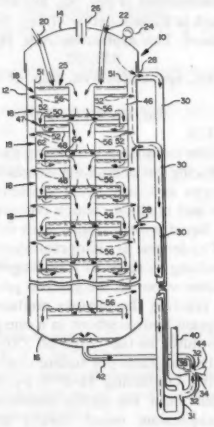
METHOD AND APPARATUS FOR PRODUCING CHLORINE DIOXIDE

Daniel Ramras, Seattle, Wash., assignor to Kenneth T. Place, Corvallis, Oreg.

Filed Oct. 9, 1979, Ser. No. 82,989

Int. Cl.³ C01B *11/02*

U.S. Cl. 252—187 R **7 Claims**



1. A continuous-flow method for manufacture of chlorine dioxide, comprising:

(a) supplying a continuous flow of solutions of each of a chlorite and a hypochlorite and an acid into the first of a plurality of reaction chambers arranged in order of descending height;

(b) allowing liquid reactants from each except the bottom one of said reaction chambers to overflow into the next lower reaction chamber;

(c) preventing gaseous reaction products from flowing from one reaction chamber to another; and

(d) removing gaseous reaction products from each reaction chamber.

4,234,447

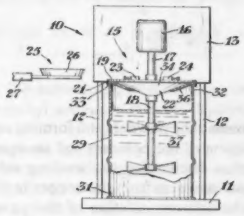
MIXING METHOD AND CONTAINER THEREFOR

Robert A. Hay, II, and Harold E. St. Louis, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 17, 1978, Ser. No. 925,016

Int. Cl.² G21F *9/16, 5/00*

U.S. Cl. 252—301.1 W **8 Claims**



1. In a method for the disposal of low-level radio-active wastes by encapsulation of the radio-active waste within a hardenable resin, the steps of the method comprising providing a disposable container and an agitator selectively disposable within the container and external to the container, the container having a generally open upwardly-facing end, adding to the container a pre-determined quantity of hardenable resinous material and radio-active waste, agitating the mixture of hardenable resin and radio-active waste until the radio-active waste is encapsulated within the hardenable resin, closing the open end of the container during the mixing process with a container cover, the container cover being maintained in a generally fixed relationship to the agitator, the container cover having a disposable splash guard generally adjacent to the disposable container, subsequently removing the agitator from the container, permitting the contents of the container to harden and transporting the container to an approved disposal site, the improvement which comprises providing a generally annular membrane partially closing the open end of the disposable container and permitting passage of the agitator therethrough, the membrane being deflected by and generally conforming to the splash guard, the membrane serving to reduce the amount of resin and radio-active material splashing directly on the splash guard.

4,234,448

METHOD AND APPARATUS FOR TREATING RADIOACTIVE WASTE

Mikio Hirano, and Susumu Horiuchi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 27, 1977, Ser. No. 846,251

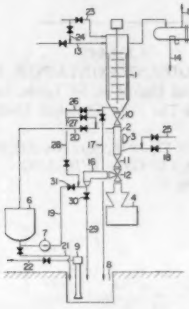
Claims priority, application Japan, Nov. 1, 1976, 51-130527

Int. Cl.² G21F *9/08, 9/20*

U.S. Cl. 252—301.1 W **16 Claims**

1. A method for treating aqueous solutions and suspensions of radioactive waste containing sodium sulfate, which comprises heating and drying the aqueous solutions and suspensions of radioactive waste in a drier thereby obtaining radioactive waste powders; transfering the powders from the drier to

a hopper; measuring a water content of the powders retained in said hopper; when the measured water content satisfies a predetermined condition, transfering the powders from the hopper to a pelletizer; and pelletizing the powders therein; or when the measured water content of the powders fails to satisfy the predetermined condition, introducing a washing solution comprising hot water under pressure to the bottom of the hopper, thereby causing a stirring action between the



washing solution and the powders and forming an admixture of an aqueous solution of the powders and an aqueous slurry of the powders; then discharging the washing solution and the radioactive waste powders from the hopper in the form of the admixture of the aqueous solution of the powders and the aqueous slurry of the powders; and thereafter drying the inside of the hopper whereby the hopper is made ready for storage of another batch of radioactive waste powders.

4,234,449

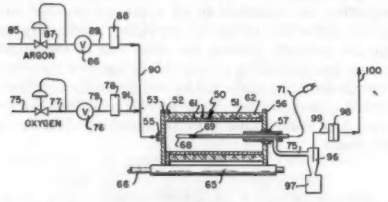
METHOD OF HANDLING RADIOACTIVE ALKALI METAL WASTE

Raymond D. Wolson, Lockport, and Charles C. McPheeters, Plainfield, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 30, 1979, Ser. No. 43,855

Int. Cl.³ G21F *9/28*

U.S. Cl. 252—301.1 W **13 Claims**



1. A method of treating radioactive aklali metals or radioactive solid salts thereof, said method comprising mixing particulate silica substrate material having a particle size such that the majority of the substrate material passes through a 200 mesh sieve and the radioactive material in a rotary drum calciner and converting the radioactive material to alkali metal monoxide by reaction with oxygen present in a diluent at a temperature sufficient to initiate the reaction thereby forming particulate substrate particles coated with alkali metal monoxide, said reaction temperature being controlled by the amount of oxygen present in the diluent to ensure the reaction product remains flowable for easy handling.

4,234,450

PREPARATION OF NON-FLUIDIZABLE COMPOSITION

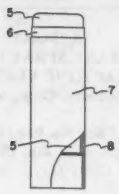
Masami Hirayama; Tadataka Nakata, and Michiko Kagayama, all of Nara, Japan, assignors to Rohto Pharmaceutical Co. Ltd., Japan

Filed Mar. 9, 1978, Ser. No. 884,992

Claims priority, application Japan, Mar. 12, 1977, 52/27213

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—314 **15 Claims**



1. A process for preparing a non-fluidizable composition readily convertible into a fluidizable composition by slight stress or pressure, which comprises the steps of cooling an emulsion consisting essentially of a water-immiscible saturated fatty acid, water within a range of from 60–80% by weight of the emulsion, and an emulsifier selected from the group consisting of a non-ionic surfactant, a solubilizing aid and a mixture thereof, said solubilizing aid being selected from the group consisting of a hydroxy group-containing amine and an alkali hydroxide from a temperature sufficient to keep the emulsion in a fluidizable state while stirring, stopping the stirring at a temperature not lower than the temperature 50° C. below the congealing temperature of the emulsion and continuing further the cooling to room temperature.

4,234,451

PROCESS OF PRODUCING A REDUCING GAS

Heinz Jockel, Klein-Gerau; Friedrich W. Möller, Seulberg; Hans J. Renner, Nieder-Erlenbach, and Hagen Krumm, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 782,471, Mar. 28, 1977, abandoned, which is a continuation of Ser. No. 589,652, Jun. 23, 1975, abandoned, which is a continuation of Ser. No. 421,565, Dec. 4, 1973, abandoned. This application Aug. 14, 1978, Ser. No. 933,353

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1972, 2263343

Int. Cl.² C07C *1/02*

U.S. Cl. 252—373 **1 Claim**

1. A process for producing a reducing gas for the reduction of ore, said reducing gas containing essentially carbon monoxide and hydrogen and only small amounts of water vapor, carbon dioxide and methane, which comprises mixing vaporized normally liquid hydrocarbons with 0.05 to 0.1 standard cubic meter of hydrogen per kilogram hydrocarbons and subjecting the resulting mixture to a hydrogenating desulfurization, adding water vapor to the gaseous product of the desulfurization and reacting the mixture containing 1.4 kg. water vapor per kilogram hydrocarbons in a one-part shaft reaction zone at temperatures in the range of 350°–550° C. and at a pressure of 2–16 kilograms per square centimeter in the presence of a catalyst containing 35–70% by weight nickel on a support selected from the group consisting of magnesium silicate and magnesium spinel hereby producing a high-methane gas, reacting said high-methane gas in a tubular reaction zone at temperatures in the range of 950°–1100° C. and at a pressure of 2–16 kilograms per square centimeter in contact with an indirectly heated catalyst containing 10–30% by

weight nickel on a support thereby producing said reducing gas.

4,234,452

HIGH PRESSURE OXYGEN AQUEOUS PHASE CATALYST DEMETALLIZATION

Emmett H. Burk, Jr., Glenwood; Jin S. Yoo, Flossmorr; Jui-Yuan Sun, South Holland, and John A. Karch, Chicago, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Mar. 26, 1979, Ser. No. 23,559

Int. Cl.³ B01J *29/38, 21/20;* **C10G** *11/05, 11/04*

U.S. Cl. 252—419 **8 Claims**

1. A process for maintaining the catalytic activity of a chemical conversion catalyst comprising:

(a) removing from a chemical conversion zone a catalyst which at least in part has carbonaceous deposits thereon and at least in part contains contaminating metals picked up during the conversion of a hydrocarbon feed containing such metal contaminants;

(b) regenerating said catalyst to remove at least a portion of said carbonaceous deposits to form a regenerated catalyst;

(c) sulfiding said regenerated catalyst to form a sulfided catalyst containing sulfur compounds of at least a portion of said contaminating metals;

(d) contacting an aqueous slurry comprising said sulfided catalyst with an oxygen-containing gas, wherein the molecular oxygen partial pressure is above about 10 psig. at a temperature and for a time sufficient to permit at least a portion of the metal contaminants to transfer from said sulfided catalyst into the aqueous portion of said aqueous slurry to produce a catalyst having a reduced content of metal contaminants.

4,234,453

OLEFIN POLYMERIZATION CATALYST

Louis J. Rekers, Wyoming; Stanley J. Katzen, and Jerome H. Krekeler, both of Cincinnati, all of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 558,504, Mar. 14, 1975, Pat. No. 3,985,676. This application Sep. 20, 1976, Ser. No. 724,484

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

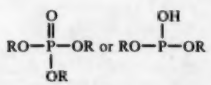
Int. Cl.³ C08F *4/02, 4/22, 4/78*

U.S. Cl. 252—428 **13 Claims**

1. An olefin polymerization catalyst system consisting essentially of:

(a) a solid inorganic support material having surface hydroxyl groups,

(b) an organophosphoryl chromium reaction product of chromium trioxide and a phosphorus compound having the formula:



wherein R is alkyl, aralkyl, aryl, cycloalkyl or hydrogen, but at least one R is other than hydrogen,

(c) an aluminum compound deposited on said support, said aluminum compound being capable of reacting with said surface hydroxyl groups,

said supported chromium containing compound and aluminum compound having been heated in a non-reducing atmosphere at a temperature above 300° C. up to the decomposition temperature of the support material.

4,234,454

DIOLEFIN DIMERIZATION CATALYST AND METHOD FOR PRODUCING NITROSYL HALIDES OF IRON TRIAD METALS

Daniel J. Strope, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 964,326, Nov. 29, 1978, Pat. No. 4,181,707, which is a division of Ser. No. 817,471, Jul. 20, 1977, Pat. No. 4,144,278. This application Jul. 27, 1979, Ser. No. 61,123

Int. Cl.³ B01J *31/22, 31/24, 27/24*

U.S. Cl. 252—429 R **8 Claims**

1. A catalyst system formed by contacting components consisting essentially of (1) at least one elemental metal selected from the group consisting of manganese, tin, and zinc with (2) at least one nitrosyl metal halide selected from the group consisting of nitrosyl metal halides having the formulas $[Fe(NO)_2X]_y$, $[Co(NO)_2X]_y$, $[Ni(NO)X]_y$, $Fe(NO)_2(L)X$, $Ni(NO)(L)X$, and $Co(NO)_2(L)X$, wherein X is selected from the group consisting of chloride, bromide, and iodide, y is 1 or 2 for Co and Fe and 1, 2, 3, or 4 for Ni, and wherein (L) is selected from the group of compounds having the formulas

R_3M, $(RO)_3M$, SR', R—S—R, R_3MO, OR', and R—O—R

wherein each R is individually selected from the group consisting of hydrocarbyl aromatic radicals, hydrocarbyl aliphatic radicals, halo-substituted hydrocarbyl aromatic radicals, halo-substituted aliphatic hydrocarbyl radicals, alkoxy-substituted hydrocarbyl aromatic radicals and alkoxy-substituted aliphatic hydrocarbyl radicals having up to about 20 carbon atoms, wherein R' is a divalent saturated or olefinically unsaturated hydrocarbyl radical having 3 to 7 carbon atoms, and wherein M is phosphorus, antimony, or arsenic.

4,234,455

CATALYST PREPARATION

Edwin H. Homeier, Maywood, and Russell W. Johnson, Villa Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Apr. 9, 1979, Ser. No. 28,631

Int. Cl.³ B01J *31/22*

U.S. Cl. 252—430 **14 Claims**

1. A catalyst prepared by admixing a metal phthalocyanine with a solid support material, shaping the resulting admixture, calcining the shaped material at a temperature of from about 400° C. to about 700° C., and recovering the resultant catalyst.

4,234,456

IODINE ADSORBENT

Kunio Kamiya, Hitachi; Hideo Yusa, Katsuta; Masao Kitamura, Hitachiota; Masaki Takeshima, Hitachi, and Toshio Ishidate, Mito, all of Japan, assignors to Hitachi, Ltd. and Nippon Engelhard Ltd., both of, Japan

Filed Jun. 13, 1978, Ser. No. 915,136

Claims priority, application Japan, Jun. 15, 1977, 52-69856

Int. Cl.² B01J *23/14, 23/50, 23/72, 27/24*

U.S. Cl. 252—438 **12 Claims**

1. An iodine adsorbent which consists essentially of a carrier having a large number of pores having a mean pore size of 200–2,000 Å, and an iodine-adsorbing material selected from the group consisting of Ag, Cu, Pb and an iodine-adsorbing salt of Ag, Cu, or Pb, supported on the carrier.

4,234,457

CRYSTALLIZED SILICA-ALUMINA COGEL AND CATALYST EMPLOYING THE SAME

Hamid Alafandi, Woodland Hills, and Dennis Stamires, Newport Beach, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 935,628, Aug. 21, 1978, Ser. No. 3,879, Jan. 16, 1979, Ser. No. 9,487, Feb. 5, 1979, Ser. No. 718,167, Sep. 9, 1976, Pat. No. 4,058,484, Ser. No. 402,448, Oct. 1, 1973, Pat. No. 4,065,069, Ser. No. 869,856, Feb. 3, 1978, Pat. No. 4,192,778, and Ser. No. 874,754, Feb. 3, 1978. This application Jun. 1, 1979, Ser. No. 44,324

Int. Cl.[3] B01J *27/24, 27/02, 29/06*

U.S. Cl. 252—438 15 Claims

1. A process of forming a host $(SiAl)O_4$, alumino silicate complex containing an in situ generated crystalline phase characterized by d spacings of Table 1 not present in the said host which comprises heating a silica alumina gel in the presence of an acid solution of rare earth cations at an autogenous superatmospheric pressure above about 250° F. and generating said crystalline phase in said host.

4,234,458

ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 886,329, Mar. 13, 1978, Pat. No. 4,148,715. This application Apr. 23, 1979, Ser. No. 32,590

Int. Cl.[3] B01J *27/08, 27/10*

U.S. Cl. 252—441 15 Claims

1. An acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, catalyst components consisting essentially of about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % nickel, about 0.01 to about 5 wt. % lanthanide series metal, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available nickel, and lanthanide series metal are uniformly dispersed throughout the porous carrier material; wherein substantially all of the lanthanide series metal is present in a positive oxidation state; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,234,459

ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 905,907, May 15, 1978. This application Jun. 8, 1979, Ser. No. 46,883

Int. Cl.[3] B01J *27/08, 27/10*

U.S. Cl. 252—441 12 Claims

1. An acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tantalum, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group, catalytically available cobalt, and tantalum components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; wherein substantially all of the tantalum component is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state or in a mixture of these states.

4,234,460

ADSORBENT FOR ETHYLENE AND PROCESS FOR PREPARATION THEREOF

Yasushi Nishimura, Tokyo; Yasuo Uehara, Iruma, and Tamio Haga, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Sep. 12, 1978, Ser. No. 941,681

Claims priority, application Japan, Sep. 22, 1977, 52-114057

Int. Cl.[3] B01J *21/18, 23/70;* B01D *53/04*

U.S. Cl. 252—447 7 Claims

1. An adsorbent for removing ethylene from a gas containing ethylene, said adsorbent containing active carbon and from 0.01 to 20% by weight of copper, said adsorbent having been obtained by

(a) contacting an active carbon with copper or a salt thereof in the presence of nitric acid;

(b) heating the resultant mixture at a temperature of 150° to 900° C. in an inert gas atmosphere whereby the desired adsorbent is obtained.

4,234,461

OXIDATION CATALYSTS

Dev D. Suresh, Macedonia; Noel J. Bremer, Stow, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to Standard Oil Company (Ohio), Cleveland, Ohio

Continuation-in-part of Ser. No. 778,658, Mar. 17, 1977, abandoned, which is a division of Ser. No. 602,343, Aug. 6, 1975, Pat. No. 4,052,418. This application Mar. 30, 1978, Ser. No. 891,786

Int. Cl.[3] B01J *23/10, 21/02, 21/00, 23/16*

U.S. Cl. 252—462 3 Claims

1. A catalyst composition having the empirical formula:

$$A_aV_bD_cO_x$$

wherein

A is arsenic and at least one element selected from the group consisting of an alkali metal, zinc, cadmium, copper, cerium, thorium, manganese and iron;

D is at least one element selected from the group consisting of chromium and antimony;

and wherein

a is a positive number less than or equal to 5;

b and c are 0.1 to 5; and

x is a number as determined by the combined valence requirements of the elements other than oxygen present in the catalyst.

4,234,462

PROCESS FOR ACTIVATING A CATALYST

Petr G. Bondar, prospekt Kosmonavtov, 15, kv. 12, and Anna S. Zavadskaya, ulitsa Lenina, 26, kv. 10, both of Severodonetsk Voroshilovgradskoi oblasti, U.S.S.R.

Filed Jan. 5, 1979, Ser. No. 1,371

Claims priority, application U.S.S.R., Jan. 5, 1978, 2558401

Int. Cl.[2] B01J *21/04, 23/26, 23/34, 23/74, 23/06, 23/72*

U.S. Cl. 252—463 22 Claims

1. A process for activating a catalyst including, as an active ingredient, at least one of the following metals: copper, chromium, nickel, cobalt, manganese, zinc, and aluminum, which process consists essentially of the steps of:

mixing the catalyst with a reducing agent selected from the group consisting of C_8–C_{35} saturated hydrocarbons, C_8–C_{19} unsaturated hydrocarbons, C_8–C_{29} alicyclic hydrocarbons, C_8–C_{10} aromatic hydrocarbons, C_{11}–C_{13} aliphatic-aromatic hydrocarbons, C_5–C_{30} monohydric alcohols, C_2–C_6 polyhydric alcohols, phenols, C_7–C_{18} aliphatic aldehydes, C_7–C_{18} aromatic aldehydes, C_7–C_{35} aliphatic ketones, C_6–C_{29} alicyclic ketones, C_2–C_{31} aliphatic carboxylic acids, C_2–C_{31} esters of aliphatic carboxylic acids, aromatic acids, carbohydrates, vegetable oils, animal fats, waxes, polyvinyl alcohol, polyvinyl acetate,

polyethylene and polybutadiene, in an amount of 4 to 15 wt.% per weight of the active ingredient of the catalyst; and subsequently heating the resulting mixture to a temperature ranging from 200° to 800° C. in an atmosphere inert to the catalyst.

4,234,463

CYCLOHEXENE METHANOL DERIVATIVES IN PERFUME

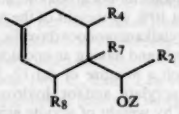
Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 048,904, Jun. 15, 1979, which is a division of Ser. No. 012,695, Feb. 16, 1979, Pat. No. 4,195,100, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Nov. 16, 1979, Ser. No. 95,087

Int. Cl.³ C11B *9/00*; A61R *7/46*

U.S. Cl. 252—522 R **4 Claims**

1. Process for augmenting or enhancing the aroma of a perfume composition comprising the steps of intimately admixing with a perfume base an aroma augmenting or enhancing quantity of at least one cyclohexane methanol derivative having the structure:



wherein R_2 is C_2–C_5 alkyl or alkenyl; R_4 is hydrogen, methyl or ethyl; R_7 is hydrogen or methyl; and R_8 is hydrogen or methyl with the proviso that R_7 and R_8 are not both hydrogen or when R_4 and R_8 are hydrogen R_7 is methyl.

4,234,464

DETERGENT BAR COMPOSITION AND BINDER THEREFOR

Fred S. Morshauser, Pequannock, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,192

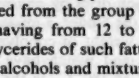
Int. Cl.² C11D *1/02, 7/32, 17/00*

U.S. Cl. 252—544 **8 Claims**

1. A detergent bar binder composition comprising the following combination of ingredients:

(a) fatty acid or alcohol component having an iodine number less than about 20 and a melting point of at least about 50° C. and being selected from the group consisting of fatty acids or alcohols having from 12 to 22 carbon atoms, mono-, di- or tri-glycerides of such fatty acids, fatty acid esters of such fatty alcohols and mixtures thereof and;

(b) alkyl amide represented by the formula:



where R_1 represents a straight chain alkyl radial containing from 10 to 22 carbon atoms and R_2 represents hydrogen or an alkyl radical containing from 1 to 3 carbon atoms, said alkyl amide being present in an amount between about 2 and about 30 wt% of said binder composition and said fatty acid or alcohol component being present in an amount between about 70 and about 90 wt% of said binder composition.

3. A detergent bar comprising the following combination of ingredients:

(a) between about 20 and about 70 wt% of the binder composition of claim 1; and

(b) between about 30 and about 80 wt% anionic foaming and foam boosting detergent.

4,234,465

DETERGENT COMPOSITION

Teruo Magari, Funabashi; Toyoyuki Sato, Tokyo, and Masayoshi Nakamura, Koshigaya, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1979, Ser. No. 24,204

Claims priority, application Japan, Mar. 30, 1978, 53-37041

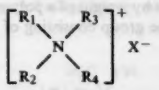
Int. Cl.³ C11D *1/62, 3/26, 7/32*

U.S. Cl. 252—547 **4 Claims**

1. A detergent composition consisting essentially of, as essential ingredients,

(i) 5 to 40% by weight of at least one component selected from the group consisting of a magnesium salt of anionic surface-active agents having a sulfonic acid group of sulfuric acid ester group, and

(ii) 2 to 7.5% by weight of at least one component selected from the group consisting of quaternary ammonium compounds having the general formula:



wherein R_1 and R_2 independently represent an alkyl or alkenyl group having 10 to 22 carbon atoms, R_3 and R_4 independently represent an alkyl group having 1 to 3 carbon atoms and X represents a chlorine atom.

4,234,466

PROCESS FOR PREPARATION OF SOLID PIGMENT RESIN DISPERSION

Mitsuru Takahashi, Hirakata; Yukio Omori, Kobe; Shuji Ikeda, Osaka, and Hiroyoshi Kataoka, Toyonaka, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Continuation of Ser. No. 630,612, Nov. 10, 1975, abandoned, which is a continuation of Ser. No. 406,173, Oct. 12, 1973, abandoned. This application Dec. 1, 1977, Ser. No. 856,803

Claims priority, application Japan, Oct. 14, 1972, 47-103103

Int. Cl.² C08L *1/14, 1/28*

U.S. Cl. 260—17 A **14 Claims**

1. A process for preparing a solid pigment dispersed composition which comprises subjecting

A. a liquid composition comprising:

i. at least one ethylenically unsaturated polymerizable compound selected from the group consisting of monovinyl aromatic hydrocarbons, ethylenically unsaturated carboxylic esters, acrylonitrile, methacrylonitrile, glycidyl vinyl compounds, ethylenically unsaturated compounds having at least one hydroxyl group, ethylenically unsaturated carboxylic acids, ethylenically unsaturated amides and ethylenically unsaturated compounds having at least one blocked isocyanate group, and

ii. at least one resin dissolved or dispersed therein, said resin being selected from the group consisting of natural resins, rosin esters, cellulose acetate, cellulose acetate butyrate, cellulose acetate propionate, cellulose methyl ether, cellulose ethyl ether, xylene resins, toluene resins, petroleum resins, silicon resins, polyurethane resins, phenol resins, aminoplast resins, epoxy resins, blocked polyisocyanate resins, acrylic resins, methacrylic resins and alkyd resins having at least one mercapto group to be grafted with the ethylenically unsaturated compound, and

B. at least one pigment dispersed in said liquid composition, to suspension or bulk polymerization to form a reaction mixture and recovering the product from suspension or bulk polymerization reaction mixture, the suspension

polymerization being performed in the presence of a suspension stabilizer to produce a spherical particulate product,

said liquid composition being color matched to said pigment before said suspension or bulk polymerization.

4,234,467

BINDER FOR PRESSURE SENSITIVE ADHESIVE

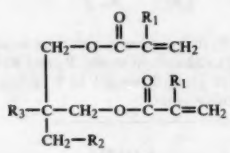
Lars-Olof Ryrfors, Perstorp, and Mats S. O. Hassander, Lund, both of Sweden, assignors to Hoechst-Perstorp AB, Perstorp, Sweden

Filed Feb. 22, 1979, Ser. No. 14,085
Claims priority, application Sweden, Mar. 3, 1978, 7802418
Int. Cl.³ C08L *33/02*
U.S. Cl. 260—29.7 H **5 Claims**

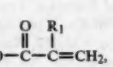
1. Process for the production of a binder for a pressure sensitive adhesive by emulsion polymerization of:

(A) 65–99.4 percent by weight of at least one acrylic ester with 4–18 carbon atoms in the alcohol part of the ester, the esters being selected whereby polymerization of only the selected esters produces a tacky polymer with a Tg-value below 0° C.;

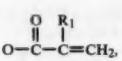
(B) 0.1 to 2 percent by weight of a polymerizable compound selected from the group consisting of a compound of the formula



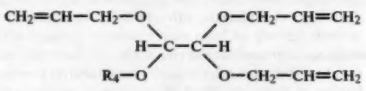
where R_1=H or CH_3,
R_2=H or



and
R_3=CH_3, C_2H_5, OH, CH_2OH or



or a compound with the formula



where R_4=CH_3 or CH_2CH=CH_2

(C) 5–0.5 percent by weight of at least one ethylenically unsaturated acid

and

(D) 28–0 percent by weight of one or more compounds selected from the group consisting of an alkyl acrylate, a hydroxyalkyl acrylate, a lower alkyl methacrylate, a hydroxyalkyl methacrylate with 1–3 carbon atoms in the alcohol part of the ester, acrylonitrile or styrene, said process comprising first copolymerizing the compounds from the groups (A), (C) and (D) in water at a temperature of about 40°–90° C. for ¼ to ¾ of the total reaction time, and then mixing therewith a compound from group (B) and completing the reaction.

4,234,468

COPOLYMER SOLUTION CONSISTING OF ACRYLIC RESIN, PROCESS FOR ITS MANUFACTURE AND THE USE THEREOF IN REACTIVE LACQUERS

Horst Dalibor, Norderstedt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 789,661, Apr. 21, 1977, Pat. No. 4,163,739. This application Feb. 21, 1979, Ser. No. 13,243
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618809
Int. Cl.³ C08F *4/38, 8/30*; C08K *5/00, 5/04*
U.S. Cl. 260—31.2 R **5 Claims**

1. A coating composition containing as an essential ingredient

(A) a copolymer solution of (I) 10 to 30% by weight of inert organic solvent and (II) 70 to 90% by weight—both percentages of (I) and (II) to 100% by weight—of copolymers containing hydroxyl groups which have been manufactured by heating to 150° to 180° C., in the presence of a mixture of diacyl peroxides or peresters and alkyl hydroperoxides or dialkyl peroxides as polymerisation initiators, a mixture of inert solvents having a boiling range of 150° to 180° C. and (a) 5–24% by weight of glycidyl esters of α-alkylalkanemonocarboxylic acids and/or α,α-dialkylalkanemonocarboxylic acids of the following empirical formula $C_{12\text{-}14}H_{20\text{-}26}O_3$, or of a mixture of glycidyl esters of α,α-dialkylalkanemonocarboxylic acids having a content up to about 10% by weight of the mixture of glycidyl esters of α-alkylalkanemonocarboxylic acids of the said empirical formula and having an epoxide equivalent of 240 to 250, to which a mixture of (b) 12–30% by weight of hydroxyethyl acrylate and/or hydroxyethyl methacrylate, (c) 1–10% by weight of acrylic acid, (d_1) 20–50% by weight of styrene and (d_2) 5–35% by weight of methyl methacrylate has been added, the components a, b, c, d_1 and d_2 having been employed in such quantities that their total is 100% by weight and the polymerisation and condensation reactions having proceeded simultaneously and jointly and the components a, b and c having been employed in such quantities that the copolymers have a hydroxyl group content of 3.5 to 6.5% by weight and

(B) a further component B_1 or B_2,

said components A and B being applied in a ratio of 60 to 80% by weight of component A and 20 to 40% by weight of component (B_1) which is an organic polyisocyanate or in a ratio of 20 to 80% by weight of component A and 80 to 20% by weight of component (B_2) which is a thermoplastic copolymer prepared from 98 to 99.5% by weight of methyl methacrylate, ethyl methacrylate or both and 0.5 to 2% by weight of methacrylic or acrylic acid, the sum of the percentages of (B_2) and the components (A) and (B) always being 100% by weight.

5. A coating which dries by physical means in the air and which contains, as the binder, a mixture consisting of:

(A') 20–80% by weight of copolymers which contain hydroxyl groups and which have been manufactured by heating to 150° to 180° C., in the presence of mixtures of diacyl peroxides or peresters and alkyl hydroperoxides or dialkyl peroxides as the polymerization initiators, a mixture of inert solvent having a boiling range of 150° to 180° C. and the component to be esterified, that is to say (a) 5–24% by weight of glycidyl esters of α-alkylalkanemonocarboxylic acids and/or α,α-dialkylalkanemonocarboxylic acids of the following empirical formula $C_{12\text{-}14}H_{20\text{-}26}O_3$, or a mixture of glycidyl esters of α,α-dialkylalkanemonocarboxylic acids having a content up to about 10 percent by weight of the mixture of glycidyl esters of α-alkylalkanemonocarboxylic acids of the said empirical formula, the mixture having an epoxide equivalent of 240 to 250, with the slow, uniform addition of (b) 12–30% by weight of hydroxyethyl acrylate and/or hydroxyethyl methacrylate, (c) 1–10% by weight of acrylic acid, (d_1) 20–50% by weight of styrene and (d_2) 5–35% by weight of methyl methacrylate, the components a, b, c, d_1 and d_2 having been employed in such

quantities that their sum adds up to 100% by weight and the polymerisation and condensation reactions proceeding simultaneously and jointly and the additional condition applying that the components a, b and c have been employed in such quantities that the copolymers have a hydroxyl group content of 3.5 to 6.5% by weight, and

(B″) 80–20% by weight of thermoplastic copolymers manufactured from 98–99.5% by weight of methyl methacrylate and/or ethyl methacrylate and 0.5–2% by weight of methacrylic acid or acrylic acid, it being necessary that the components A′ and B″ add up to 100% by weight.

4,234,469

FLAME RETARDING POLYOLEFIN RESIN BLEND COMPOSITION

Yuzo Ohta, Ichihara; Norio Sugi, Sodegauro; Osamu Isogai, Ichihara; Takahiro Hirai, and Hidehiko Kaji, both of Sodegaura, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation of Ser. No. 759,625, Jan. 17, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,184

Claims priority, application Japan, Jul. 29, 1976, 53-89682

Int. Cl.[2] C08L *23/06, 23/12*

U.S. Cl. 260—42.46 **3 Claims**

1. A composition consisting essentially of from 30 to 80 percent by weight of polypropylene having a melt index of from 0.5 to 15.0 grams per 10 minutes (temperature: 230° C., load: 2.16 kilograms), from 5 to 25 percent by weight of polyethylene having a melt index of from 0.01 to 2.0 grams per 10 minutes (temperature: 190° C., load: 2.16 kilograms), from 20 to 40 percent by weight of at least one inorganic filler selected from the group consisting of powdered talc, kaolinite, sericite, silica and diatomaceous earth, from 5 to 35 percent by weight of an organic halide flame retarder, and an inorganic antimony compound as a flame retarding assistant in an amount of from $\frac{1}{4}$ to $\frac{1}{2}$ of the amount of said flame retarder, in which the amount of each component is based on the total amount of polypropylene, polyethylene and inorganic filler, said composition containing no chlorinated polyalkanes.

4,234,470

CATALYTIC NITRATION OF AROMATIC COMPOUNDS

Frederick R. Lawrence, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 23, 1979, Ser. No. 32,346

Int. Cl.[3] C07C *79/10*

U.S. Cl. 568—939 **9 Claims**

1. In the process for the continuous catalytic vapor-phase mononitration of an aromatic compound, in which the aromatic compound, a nitrating agent and a particulate α-fluorosulfonic acid polymer catalyst are brought together under conditions suitable for nitration, the improvement which comprises admixing the catalyst, before it is used, with at least 10%, by volume of the catalyst, of a particulate complement, inert to the nitration reaction, dimensionally stable under the reaction conditions, and having a particle size of −U.S.S. 3½ +U.S.S. 325.

4,234,471

NOVEL POLYALKYL-PIPERIDINE POLYMERS, THEIR PREPARATION AND USE

Hartmut Wiezer, Gersthofen; Helmut Korbanka, Adelsried, and Gerhard Pfahler, Augsburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

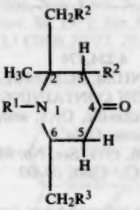
Filed Sep. 7, 1979, Ser. No. 73,540

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1978, 2839711

Int. Cl.[3] C08K *5/16;* **C08G** *12/26*

U.S. Cl. 260—45.8 N **4 Claims**

1. A process for the preparation of polyalkyl-piperidine/formaldehyde polymers which comprises reacting a polyalkyl-piperidone-4 of the formula (I)



(I)

in which

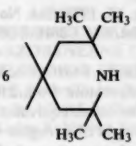
R^1 is hydrogen, oxygen or C_1–C_{12}-alkyl,

R^2 and R^3 are either identical and represent hydrogen or a C_1–C_5-alkyl group,

R^4 being a methyl group in this case; or

R^2 is hydrogen or C_1–C_5-alkyl, and

R^3 and R^4 together with the carbon atoms linked to them form a C_5 or C_6 cycloalkyl group, or a group of the formula



with the 0.5- to 1.1-fold molar amount of paraformaldehyde at a temperature of from 50° to 180° C. in the presence of an aliphatic C_1–C_{10}-monoalcohol and of an alkaline base,

and subsequently optionally hydrogenating the product obtained either completely or partially according to known processes.

3. A process for stabilizing synthetic polymers against the damaging influence of light, which comprises adding to the polymer from 0.01 to 5 parts by weight, relative to the polymer, of a polymer stabilizer as claimed in claim 2, optionally in addition to hitherto known stabilizing substances.

4,234,472

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

Elmer D. Dickens, Jr., Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 1, 1979, Ser. No. 16,582

Int. Cl.[3] C08K *3/22*

U.S. Cl. 260—45.75 M **5 Claims**

1. A smoke retardant composition consisting essentially of a vinyl chloride or vinylidene chloride polymer containing a predominant amount of vinyl chloride or vinylidene chloride together with a smoke retardant amount of cobaltous oxide (CoO).

4,234,473

DODECYL-1,12-DIAMMONIUM DIMOLYBDATE AND COMPOSITION CONTAINING SAME

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 30, 1979, Ser. No. 62,444

Int. Cl.[3] C07F *11/00*

U.S. Cl. 260—45.75 R **4 Claims**

1. Dodecyl-1,12-diammonium dimolybdate having the empirical formula $H_2(CH_2)_{12}(NH_2)_2Mo_2O_7$ and having major

x-ray diffraction peaks at "d" spacings of 18.4A, 9.03A and 4.27A.

4,234,474

TRIBENZYLAMMONIUM OCTAMOLYBDATE AND COMPOSITION CONTAINING SAME

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 30, 1979, Ser. No. 62,445

Int. Cl.³ C08K *00/00*

U.S. Cl. 260—45.75 R **4 Claims**

1. Tribenzylammonium octamolybdate having the empirical formula $[H(C_6H_5CH_2)_3N]_6(Mo_8O_{27}).4H_2O$ and having major x-ray diffraction peaks at "d" spacings of 13.0 A, 9.09 A, 4.80 A and 4.27 A.

4,234,475

REACTING PROTEIN WITH ORGANIC ACID

Phillip E. Sokol, Rockville, Md., assignor to The Gillette Company, Boston, Mass.

Filed Aug. 15, 1975, Ser. No. 605,166

Int. Cl.³ C08H *1/06*

U.S. Cl. 260—112 R **4 Claims**

1. The method of making a surface active agent which comprises heating at a temperature from 210° but not exceeding 260° C., a mixture of one to ten equivalent weights of a protein with one equivalent weight of a reagent which is a member of the group consisting of aromatic carboxylic acids, alkylated aromatic carboxylic acids in which each alkyl group has from 1 to 6 carbon atoms, halogenated aromatic carboxylic acids, and saturated and unsaturated aliphatic carboxylic acids having from 6 to 54 carbon atoms.

4,234,476

APPLICATION OF PROTEIN-PROTEIN INTERACTION AS AN ASSAY FOR THE DETECTION OF CANCER

Edsel T. Bucovaz; John C. Morrison, both of Memphis; William C. Morrison, Germantown, and Walter D. Whybrew, Memphis, all of Tenn., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 727,633, Sep. 29, 1976, Pat. No. 4,160,817. This application Mar. 7, 1978, Ser. No. 884,288

Int. Cl.² A23J *1/18;* C07G *7/03*

U.S. Cl. 260—112 R **1 Claim**

1. Purified CoA-SPC Bakers' yeast extract characterized by a molecular weight of greater than 200,000 and by utilizing the substrates L-cysteine, D-pantothenic acid and ATP to produce CoA.

4,234,477

α-N-ACETYL-L-PHENYLALANYL-L-ARGININE ETHYL ESTER

Franz Fiedler, Munich, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 18,702

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1978, 2813772

Int. Cl.³ C07C *103/52;* C12Q *1/36*

U.S. Cl. 260—112.5 R **7 Claims**

1. Acetylphenylalanyl-arginine ethyl ester or an acid addition salt thereof.

4,234,478

PROCESS AND APPARATUS FOR THE DIAZOTIZATION OF AMINES

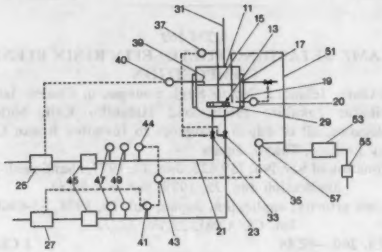
John H. Atherton, and Ian Hodgkinson, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 8, 1979, Ser. No. 10,478

Claims priority, application United Kingdom, Feb. 14, 1978, 581978/78; Nov. 20, 1978, 45292/78

Int. Cl.³ C07C *113/00*

U.S. Cl. 260—141 **10 Claims**



1. A process for the diazotisation of a heterocyclic or a weakly basic benzenoid amine which comprises reacting together in a continuous manner, in a reaction zone from which a product stream containing diazotised amine is continuously removed, the amine and an aqueous solution of nitrite ions in the presence of sulphuric acid, the proportions and concentrations of the amine, the aqueous solution of nitrite ions and the sulphuric acid beig so arranged as to provide a working acid concentration in the reaction zone in which the diazotised amine is stable.

4,234,479

CHROMIUM MIXED COMPLEX DYESTUFFS OF PHENYL-AZO-PYRAZOLE COMPONENTS

Winfried Mennicke, Leverkusen; Walter Scholl, Cologne, and Karl-Heinz Schündehütte, Opladen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

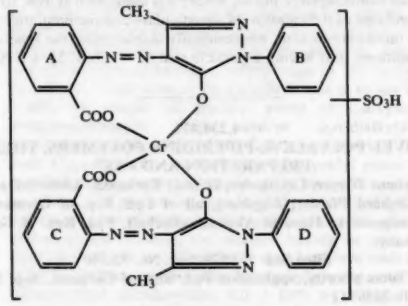
Continuation of Ser. No. 452,929, Mar. 20, 1974, abandoned. This application Jan. 26, 1977, Ser. No. 762,480

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1973, 2313722

Int. Cl.² C09B *45/02, 45/06, 45/16;* D06P *1/10*

U.S. Cl. 260—145 B **2 Claims**

1. Unsymmetrical chromium mixed complex dyestuff which in the form of the free acid has the formula



wherein

SO_3H is bonded to one of the rings A, B, C or D; the rings

A and C are phenyl or phenyl substituted by nitro, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_2–C_5-alkyl-carbonylamino, C_2–C_5-alkylcarbonyl or carboxyl; and

the rings B and D are phenyl; phenyl substituted by nitro, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_2–C_5-alkylcarbonylamino, C_2–C_5-alkylcarbonyl or carboxyl; or naphthyl.

4,234,480
WATER-SOLUBLE AZO DYESTUFFS

Erich Krämer, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

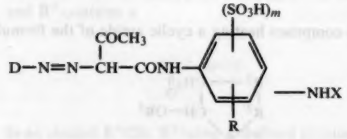
Filed Aug. 24, 1978, Ser. No. 936,493

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738510

Int. Cl.³ C09B *29/22*

U.S. Cl. 260—157 **4 Claims**

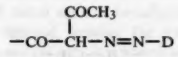
1. Azo dyestuffs which, in the form of the free acid, correspond to the general formula



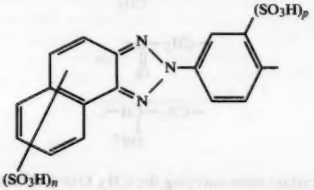
(I)

in which

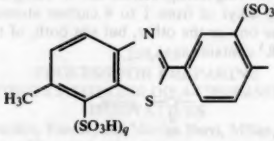
X denotes a radical of the formula



D denotes a radical of the formulae



or



R denotes hydrogen, methyl, ethyl, methoxy, ethoxy or chlorine,

m, p, q and r denote 0 or 1 and

n denotes 1 or 2,

with the proviso that the dyestuffs contain at least 2 sulphonic acid groups.

4,234,481
YELLOW PYRAZOLONE ESTER DYES FOR HEAT TRANSFER PRINTING

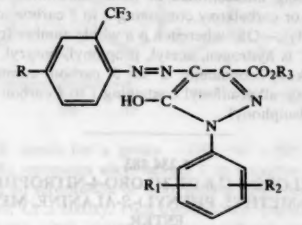
Russell I. Steiner, Reading, Pa., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Nov. 30, 1977, Ser. No. 847,892

Int. Cl.³ C09B *29/22, 29/36, 29/50*

U.S. Cl. 260—163 **9 Claims**

1. A compound of the formula



where R is hydrogen or halogen, and R_1 and R_2 independently of one another are hydrogen, or halogen, and R_3 is lower alkyl.

4,234,482
SUBSTITUTED 3-CARBALKOXY 4-ALKYLAMINO-AZOBENZENE COMPOUND AS DISPERSE DYESTUFFS FOR SYNTHETIC FIBERS

Claude M. H. E. Brouard, Sotteville les Rouen, and Jean-Pierre H. Stiot, Saint Pierre les Elbeuf, both of France, assignors to Produits Chimiques Ugine Kuhlmann Service Propriete Industrielle, Paris, France

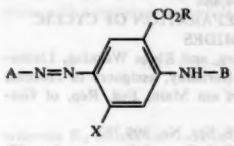
Filed Jul. 8, 1975, Ser. No. 594,405

Claims priority, application France, Aug. 7, 1974, 74 23605

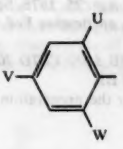
Int. Cl.³ C09B *29/04, 29/36, 33/16*; D06P *3/54*

U.S. Cl. 260—187 **2 Claims**

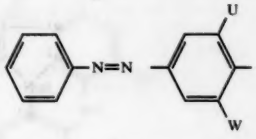
1. A dyestuff represented by the formula:



wherein A is V



or



U is chlorine, bromine, cyano, nitro, carbomethoxy, carbethoxy or mesyl,

V is cyano, nitro or mesyl,

W is hydrogen, chlorine, bromine, cyano or nitro,

R is alkyl containing 1 to 4 carbon atoms,

X is hydrogen, bromine, chlorine, acetylamino, benzoylamino, alkoxycarbonylamino containing 2 to 5 carbon atoms, phenoxycarbonylamino, alkylsulfonylamino containing 1 to 4 carbon atoms or phenylsulfonyamino, and

B is

β-chlorethyl,
β,γ-dichloropropyl,
3,3,4,4,4-pentafluorobutyl,
alkyl containing 1 to 4 carbon atoms unsubstituted or mono-substituted by cyano, nitro, phenyl, phenoxy, alkoxy containing 1 to 4 carbon atoms, carbophenoxy, alkylsulfonyl containing 1 to 4 carbon atoms, phenylsulfonyl, acetyl, cyanalkoxy containing 2 to 5 carbon atoms or carbalkoxy containing 2 to 5 carbon atoms, said carbalkoxy being unsubstituted or mono-substituted by cyano, acetyl or carbalkoxy containing 2 to 5 carbon atoms,
or $-(CH_2)_n-OR'$ wherein n is a whole number from 1 to 4 and R' is hydrogen, acetyl, propionyl, butyryl, benzoyl, carbalkoxy containing 2 to 5 carbon atoms, carbophenoxy, alkylsulfonyl containing 1 to 4 carbon atoms or phenylsulphonyl.

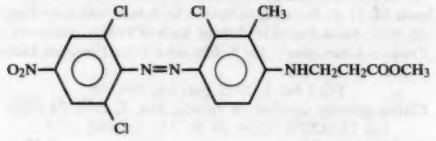
4,234,483

N-(3-CHLORO-4-[2,6-DICHLORO-4-NITROPHENYL-)AZO]-2-METHYL PHENYL)-β-ALANINE, METHYL ESTER

Raouf Botros, Beech Creek, and Ivan E. Riggle, Lock Haven, both of Pa., assignors to American Color & Chemical Corporation, Charlotte, N.C.

Filed Aug. 11, 1976, Ser. No. 713,619
Int. Cl.[3] C09B *29/08;* **D06P** *3/04, 3/24, 3/52*
U.S. Cl. 260—207.1 **1 Claim**

1. The azo compound represented by the formula:



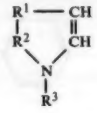
4,234,484

PROCESS FOR THE PREPARATION OF CYCLIC ENAMIDES

Michael Mitzlaff, Bad Homburg, and Klaus Warning, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 899,783
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718666
Int. Cl.[3] C07B *3/00;* **C07D** *202/20, 207/27, 223/04*
U.S. Cl. 260—239 BE **18 Claims**

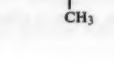
1. A process for the preparation of a cyclic enamide of the formula



in which R^1 is a single bond or alkylene of from 1 to 8 carbon atoms

R^2 is $-CH_2-CH_2-$,

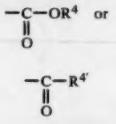
$-CH=CH-$,



-continued

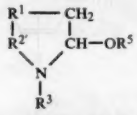
in which the carbon atom carrying the CH_3 or the oxygen radical is bound to the ring nitrogen atom:

R^3 is a hydrogen atom, secondary or tertiary alkyl of 3 or 4 carbon atoms,



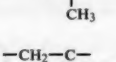
in which R^4 is alkyl of from 1 to 6 carbon atoms; phenyl; phenyl substituted by at least one member of the group consisting of alkyls of from 1 to 4 carbon atoms, fluorine, chlorine and bromine; benzyl; or benzyl substituted by at least one member of the group consisting of alkyls of from 1 to 4 carbon atoms, fluorine, chlorine and bromine; and $R^{4'}$ has the same meaning as R^4 or is hydrogen; provided that either one or the other, but not both, of the radicals R^2 and R^3 contains a

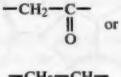
which comprises heating a cyclic amide of the formula



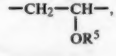
in which R^1 and R^3 are as defined previously, and $R^{2'}$ is

$-CH_2-CH_2-$,





or

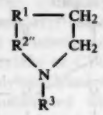


the carbon atom carrying the CH_3, O or OR^5 radical being bound to the ring nitrogen atom and R^5 being a primary or secondary alkyl of from 1 to 4 carbon atoms, provided that either one or the other, but not both, of the radicals $R^{2'}$ and R^3 contains a

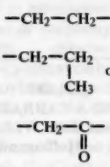
to a temperature of from about 100° to 250° C., in the presence of a catalyst selected from the group consisting of tetraalkylammonium salts of tetrafluoroboric acid, alkali metal salts of tetafluoroboric acid, tetraalkylammonium salts of hexafluorophosphoric acid and alkali metal salts of hexafluorophosphoric acid, and mixtures

thereof, distilling off the detached alcohol R^5OH, and isolating the enamide.

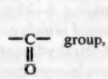
2. A process as claimed in claim 1, which further comprises producing a cyclic amide by anodically alkoxylating a cyclic nitrogen compound of the formula



R^1 and R^3 being as defined previously and $R^{2''}$ being



the carbon atom carrying the CH_3 or the oxygen radical being bound to the ring nitrogen atom, provided that either one or the other, but not both, of the radicals $R^{2''}$ and R^3 contains a



in an alcohol R^5OH, R^5 being as defined previously, in the presence of a supporting electrolyte which is selected from the group consisting of tetraalkylammonium salts of tetrafluoroboric acid, alkali metal salts of tetrafluoroboric acid, tetraalkylammonium salts of hexafluorophosphoric acid and alkali metal salts of hexafluorophosphoric acid, and mixtures thereof, heating the cyclic amide in the presence of a catalyst which is identical with said electrolyte, and distilling off the alcohol R^5OH.

4,234,485

PROCESS FOR PREPARING 4-DESOXY-THIAZOLO[5,4-C]RIFAMYCIN DERIVATIVES

Renato Cricchio, Varese, and Marisa Berti, Milan, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

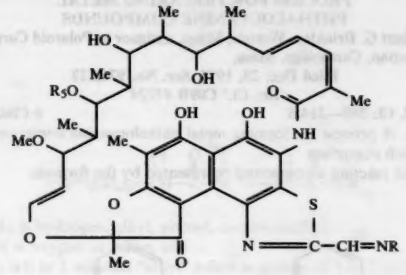
Division of Ser. No. 21,866, Mar. 19, 1979. This application Oct. 29, 1979, Ser. No. 88,977

Claims priority, application Italy, Apr. 27, 1978, 22738 A/78

Int. Cl.[3] **C07D** *51/20;* **A61K** *31/425*

U.S. Cl. 260—239.3 P **4 Claims**

1. A process for preparing a 4-desoxy-thiazolo[5,4-c]rifamycin of the formula

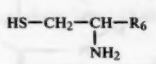


wherein R stands for a group $—OR_1$, or $—NH—CO—R_4$ wherein R_1 represents alkyl having 1 to 8 carbon atoms per group and no substitution or halo, amino, mono- or di- (C_{1-4}) alkylamino, C_{1-4} alkoxy, C_{5-8} cycloalkoxy, phenoxy phenyl (C_{1-4}) alkoxy, nitro, cyano, hydroxy, carboxy, carbo (C_{1-4}) alkoxy or carbamoyl substitution; alkenyl having up to 8 carbon atoms per group which contains one or two double bonds, alkynyl having up to 8 carbon atoms per group which contains one or two triple bonds, cycloalkyl having a cycloaliphatic ring containing from 5 to 8 carbon atoms and having up to two C_{1-4} alkyl substituents, aryl or aralkyl wherein aryl as such or in a compound term designates phenyl or phenyl having halo, C_{1-4} alkyl, halo (C_{1-4}) alkyl, C_{1-4} alkenyl, C_{5-8} cycloalkyl, amino, mono- or di- (C_{1-4}) alkylamino, C_{1-4} alkoxy, methylenedioxy, cyano, carboxy, hydroxy, carbo (C_{1-4}) alkoxy, carbamoyl or nitro substitution,

R_2 and R_3 are independently selected from hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl and aralkyl, as defined above, or R_2 and R_3 taken together with the adjacent nitrogen atom may form a 5–7 membered heterocyclic ring wherein the hetero atoms are nitrogen, and

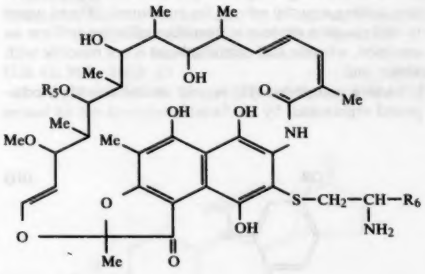
R_5 is hydrogen or acetyl;

which comprises reacting rifamycin S or its 25-desacetyl derivative with a cysteine derivative of formula III



III

wherein R_6 stands for —H or —COOH in a water-miscible organic solvent, at a temperature comprised between room temperature and the boiling temperature of the reaction mixture whereby a 3-[(2-substituted ethyl)thio]rifamycin derivative of formula V



V

is obtained wherein

R_5 and R_6 are as defined before, and contacting said derivative with about a equimolar amount of a compound of formula H_2NR wherein R is as defined before and at least the stoichiometric amount of an oxidizing agent.

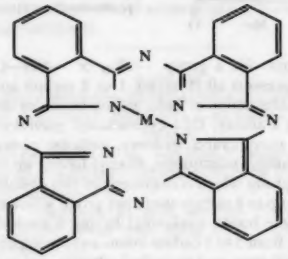
4,234,486
PROCESS FOR PREPARING METAL PHTHALOCYANINE COMPOUNDS

Robert G. Brinkley, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 29, 1978, Ser. No. 974,222
Int. Cl.³ C09B 47/24
U.S. Cl. 260—314.5 6 Claims

1. A process for forming metal phthalocyanine compounds which comprises

(a) reacting a compound represented by the formula:

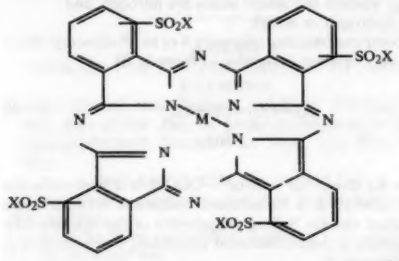


(I)

where M is a metal chosen from the group consisting of cobalt, nickel, copper, chromium, magnesium and zinc with compounds represented by the formulas:

X SO_3 H and SO X_2

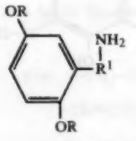
where X is a halogen to form a compound represented by the formula:



(II)

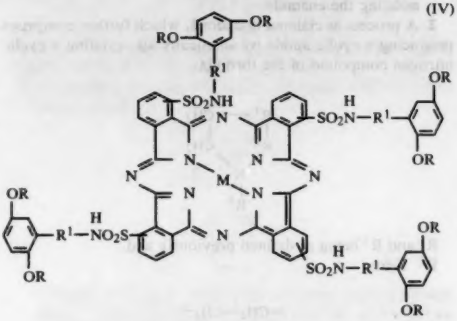
(b) without isolating compound (II) from the reaction mixture, adding a partial solvent for compound (II) and water to said reaction mixture in quantities effective to form an emulsion, wherein said partial solvent is not miscible with water; and

(c) reacting compound (II) in said emulsion with a compound represented by the formula:



(III)

where R is alkyl having from 1 to 6 carbon atoms and R^1 is alkylene having from 1 to 6 carbon atoms to form a compound represented by the formula:



(IV)

4,234,487
PROCESS OF MAKING A CARBAZOLE ACETIC ACID

Leo Berger, Montclair, and John W. Scott, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 972,142, Dec. 21, 1978, Pat. No. 4,179,443, which is a division of Ser. No. 914,465, Jun. 12, 1978, Pat. No. 4,146,542. This application May 3, 1979, Ser. No. 35,669
Int. Cl.³ C07D 209/82
U.S. Cl. 260—315 1 Claim

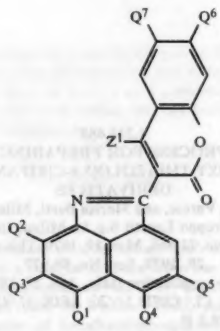
1. A process for preparing 6-chloro-α-methylcarbazole-2-acetic acid and esters thereof which comprises the steps of (a) reacting 6-chloro-1,2,3,4-tetrahydrocarbazole-2-one with trilower alkyl-α-methylphosphonoacetate in the presence of a strong base, and (b) aromatizing the reaction product of step (a), prior to or after saponification, to yield 6-chloro-α-methylcarbazole-2-acetic acid or ester.

4,234,488
BENZ-[C,D]-INDOLYL COMPOUNDS

Horst Harnisch, Cologne, and Alfred Brack, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 890,688, Mar. 27, 1978, Pat. No. 4,147,865, which is a continuation of Ser. No. 763,142, Jan. 27, 1971, abandoned. This application Dec. 29, 1978, Ser. No. 974,609
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603592
Int. Cl.³ C07D 405/04
U.S. Cl. 260—326.27 10 Claims

1. Dyestuff of the formula



wherein

Z^1 represents OH or NT^1T^2;
T^1 represents H; or C_1-C_4-alkyl which is unsubstituted or substituted by C_1-C_2-alkoxy or chlorine;
T^2 represents H; or C_1-C_4-alkyl which is unsubstituted or substituted by C_1-C_2-alkoxy or chlorine;
Q^1 represents H; fluorine; chlorine; bromine; iodine; hydroxyl; C_1-C_4-alkoxy; cyclohexyloxy; benzyloxy; phenoxy; phenylsulphonyloxy; sulphydryl; C_1-C_4-alkylmercapto unsubstituted or substituted with OH, Cl, Br, CN, C_1-C_2-alkoxy, benzyloxy or C_1-C_2-alkoxycarbonyl; benzylmercapto; p-tolylmethylmercapto; phenylmercapto unsubstituted or substituted with C_1-C_4-alkyl, C_1-C_2-alkoxy, CF_3, chlorine, bromine, amino, C_1-C_2-alkylcarbonylamino, C_1-C_2-alkylsulphonylamino, chlorosulphonyl, $Q^8O—SO—$, $Q^9Q^{10}N—SO_2—$ or nitro; naphthylmercapto; amino monosubstituted or disubstituted with C_1-C_4-alkyl or benzyl or monosubstituted by phenyl; C_1-C_4-alkylcarbonylamino or -sulphonylamino unsubstituted or substituted with chlorine; C_1-C_4-alkylureido; phenylureido; C_1-C_2-alkoxycarbonylamino; phenoxycarbonylamino; benzoylamino unsubstituted or substituted with methyl, methoxy, or chlorine; nitro; C_1-C_4-alkylsulphonyl unsubstituted or substituted with chlorine or hydroxyl; phenylsulphonyl or phenylsulphinyl unsubstituted or substituted with C_1-C_4-alkyl, chlorine, or bromine; chlorosulphonyl; $Q^8O—SO_2—$; $Q^9Q^{10}N—SO_2—$; $Q^9Q^{10}N—CO—$; $Q^{11}O—CO—$; or cyano;
Q^2 represents hydrogen, chlorine, bromine, phenylmercapto, or ethyl;
Q^3 represents hydrogen or bromine;
Q^4 represents hydrogen, C_1-C_2-alkoxy, chlorine, bromine, or phenylmercapto;
Q^5 represents hydrogen or bromine;
Q^6 represents hydrogen, methyl, hydroxyl, C_1-C_4-alkoxy, benzyloxy, di-(C_1-C_2-alkyl)-amino, chlorine, or bromine;
Q^7 represents hydrogen; methyl; C_1-C_2-alkoxy; chlorine; or bromine; or, conjointly with Q^6, represents methylenedioxy or —CH=CH—CH=CH— which is linked to position 5 of the coumarin ring system;
Q^8 represents H; C_4-C_8-alkyl; cyclohexyl unsubstituted or substituted with methyl; or phenyl-C_1-C_3-alkyl;
Q^9 represents unsubstituted C_1-C_6-alkyl; C_1-C_3-alkyl which is substituted by OH, Cl, CN, C_1-C_2-alkoxy, di-(C_1-C_2-alkyl)-amino, or tri-(C_1-C_2-alkyl)-ammonium, or phenyl-C_1-C_2-alkyl, cyclohexyl or cyclohexylmethyl; and
Q^{10} represents H; unsubstituted C_1-C_4-alkyl; or C_1-C_2-alkyl which is substituted by OH, Cl, CN or C_1-C_2-alkoxy;
Q^{11} represents H; C_1-C_2-alkyl; phenyl-C_1-C_2-alkyl; or phenyl; or an acid salt of the dyestuff with organic or inorganic colorless acids when $Z^1 = NT^1T^2$.

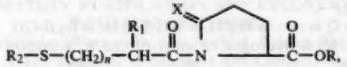
4,234,489

PYROGLUTAMIC ACID DERIVATIVES AND ANALOGS

Miguel A. Ondetti, Princeton; Eric M. Gordon, Pennington, and Denis E. Ryono, Princeton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

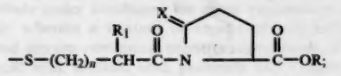
Filed Jun. 25, 1979, Ser. No. 51,772
Int. Cl.³ C07D *207/36*; A61K *31/40*
U.S. Cl. 260—326.42 **17 Claims**

1. A compound having the formula



or a salt thereof, wherein
R is hydrogen, alkyl or diphenylmethyl;
R_1 is hydrogen, alkyl or trifluoromethyl;
R_2 is hydrogen,

or



R_3 is hydrogen, alkyl, phenyl, or phenylalkyl;
X is oxygen or sulfur; and
n is 0 or 1 wherein "alkyl" refers to groups of 1 to 7 carbon atoms.

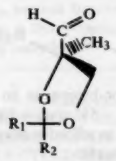
4,234,490

INTERMEDIATES IN THE SYNTHESIS OF VITAMIN E

Richard Barner, Witterswil, and Max Schmid, Brugg, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 905,361, May 12, 1978, Pat. No. 4,153,614. This application Jan. 18, 1979, Ser. No. 4,503
Claims priority, application Luxembourg, May 16, 1977, 77344
Int. Cl.³ C07D *317/10*
U.S. Cl. 260—340.9 R **1 Claim**

1. A compound of the formula



XI

wherein R_1 and R_2 each are lower alkyl or R_1 is phenyl and R_2 is hydrogen.

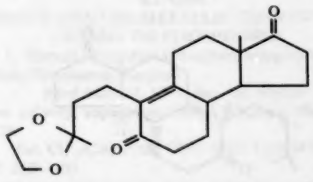
4,234,491

STEROID SYNTHESIS PROCESS USING MIXED ANHYDRIDE

Gary F. Cooper, Menlo Park, and Albert R. Van Horn, Los Altos, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

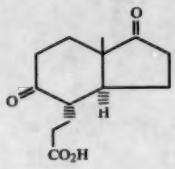
Division of Ser. No. 916,443, Jun. 19, 1978, Pat. No. 4,158,012. This application Mar. 22, 1979, Ser. No. 22,667
Int. Cl.³ C07D *317/12*
U.S. Cl. 260—340.9 AS **8 Claims**

1. A process for the preparation of the compound represented by the formula



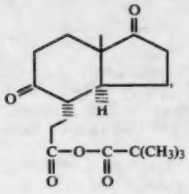
(I)

which comprises
(a) treating a compound represented by the formula



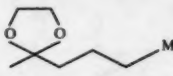
(II)

with pivaloyl chloride in the presence of a tertiary amine to afford a mixed anhydride represented by the formula

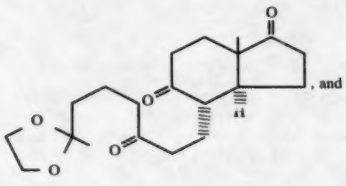


(III)

(b) treating said mixed anhydride with a Grignard reagent of the formula



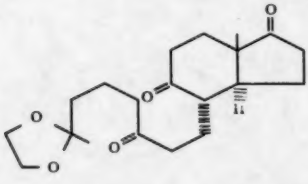
wherein X is chloro or bromo, in an ether solvent at a temperature between −55° and −80° C., followed by treatment with water, to afford a triketoketal compound represented by the formula



(IV)

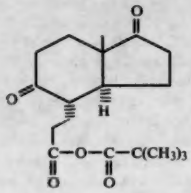
(c) treating said triketoketal compound with base in an aqueous medium at a temperature between about 50° and 80° C. to afford said compound of formula (I).

6. A process for the preparation of the compound represented by the formula



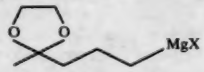
(IV)

which comprises treating a mixed anhydride of the formula



(III)

with a Grignard reagent of the formula



wherein X is chloro or bromo, in an ether solvent at a temperature between about −55° and −80° C., followed by treatment with water.

4,234,492

2-DECARBOXY-2-AMINOMETHYL-9-DEOXY-6,9α-EPOXYMETHANO-5,6-DIDEHYDRO-PGF$_1$ COMPOUNDS

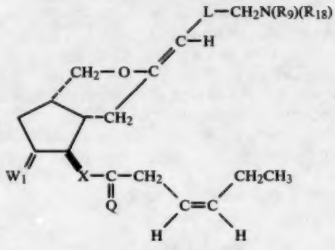
Robert C. Kelly, Kalamzoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 935,392, Aug. 21, 1978, which is a division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,771, Aug. 23, 1976, abandoned. This application Aug. 16, 1979, Ser. No. 67,493

Int. Cl.^{3} C07D *311/02*

U.S. Cl. 260—345.2 **13 Claims**

1. A 5E compound of the formula



wherein W_1 is α-OH:β-H, α-H:β-OH, oxo, methylene, α-H:β-H, α-CH_2OH:β-H;

wherein L is

(1) $-(CH_2)_d-C(R_2)_2$,

(2) $-CH_2-O-CH_2-Y-$, or

(3) $-CH_2CH=CH-$,

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$,

wherein Q is oxo, α-H:βH, α-OH:βR_8 or α-R_8:β-OH

wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_9 is hydrogen, methyl, or ethyl;

wherein R_{18} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive; and

wherein X is
(1) trans—CH=CH—,
(2) cis-CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—;
including the lower alkanoates thereof.

4,234,493

9-DEOXY-6,9α-EPOXYMETHANO-5,6-DIDEHYDRO-PGF_1, AMIDE

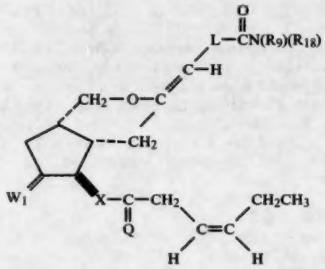
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 935,392, Aug. 21, 1978, which is a division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,771, Aug. 23, 1976, abandoned. This application Aug. 16, 1979, Ser. No. 67,492

Int. Cl.³ C07D *311/02*

U.S. Cl. 260—345.2 **13 Claims**

1. A 5E compound of the formula



wherein W_1 is α—OH:β—H, α—H:β—OH, oxo, methylene, α—H:β—H, α—CH_2OH:β—H;
wherein L is
(1) —(CH_2)d—$C(R_2)_2$,
(2) —CH_2—O—CH_2—Y—, or
(3) —CH_2CH=CH—,
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, —CH_2— or —$(CH_2)_2$—,
wherein Q is oxo, α—H:β—H, α—OH:β—R_8 or α—R_8-:β—OH
wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_9 is hydrogen, methyl, or ethyl;
wherein R_{18} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive; and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—;
including the lower alkanoates thereof.

4,234,494

FORMATION, PURIFICATION AND RECOVERY OF PHTHALIC ANHYDRIDE

Hobe Schroeder, Warrenville, and David A. Palmer, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 29, 1979, Ser. No. 70,662

Int. Cl.² C07D *307/89*

U.S. Cl. 260—346.7 **7 Claims**

1. A process for the formation, purification and recovery of phthalic anhydride from a mixture, comprising on a weight basis, from 70 up to 90 percent o-phthalic acid, from 1.5 up to 21 percent water, from 0.3 up to 13 percent benzoic acid, from 0.2 up to 2 percent o-toluic acid, from 0.1 up to 2 percent phthalide, from 0.2 up to one percent 2-carboxybenzaldehyde, and from 1.3 up to 4 percent higher boiling compounds; which process comprises subjecting said mixture as a liquid to the sequential steps of (a) rapid dehydration of o-phthalic acid to its anhydride under conditions for rapid evaporation of said anhydride wherein a mixture of vapors of said anhydride, water, and oxygen-containing aromatic compounds comprising benzoic acid, o-toluic acid, phthalide and 2-carboxybenzaldehyde is formed; (b) contacting the vapor mixture obtained from step (a) with a noble metal catalyst; (c) separating water vapor from said mixture of vapors by contacting in a fractionation zone such mixture of vapors in countercurrent flow with a reflux liquid at a temperature below the boiling temperature of said anhydride which liquid is inert to the components of said mixture of vapors, a solvent for said anhydride at a temperature between its freezing point and its melting point, remains liquid at and below the freezing point temperature of said anhydride, boils at a temperature below the boiling point temperature of said anhydride, is substantially immiscible with water and does not form an azeotrope with said anhydride; (d) a zeotrope removal of phthalide from the resulting water free mixture of said anhydride and said oxygen-containing aromatic compounds by heating to a temperature above 250° C. such mixture of said anhydride and oxygen-containing aromatic compounds in the presence of an alkali metal hydroxide having a molecular weight of at least 56 until the presence of phthalide is no longer detectable; and (e) fractionation of the mixture resulting from step (d) to remove: as a first fraction containing substantially all of the benzoic acid, o-toluic acid and 2-carboxybenzaldehyde; as a second fraction product phthalic anhydride and leaving as a third fraction the compounds boiling higher than phthalic anhydride.

4,234,495

PROCESS FOR PREPARING 1α-HYDROXYVITAMIN D COMPOUNDS FROM 1α-HYDROXY-3,5-CYCLOVITAMIN D COMPOUNDS

Hector F. DeLuca; Heinrich K. Schnoes; David E. Hamer, all of Madison, and Herbert E. Paaren, Verona, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sep. 10, 1979, Ser. No. 73,839

Int. Cl.³ C07J *9/00*

U.S. Cl. 260—397.2 **12 Claims**

1. A process for preparing 1α-hydroxyvitamin D compounds which comprises
solvolizing, in the presence of an acid catalyst, a 1α-hydroxy-3,5-cyclovitamin D compound corresponding to the 1α-hydroxyvitamin D compound which it is desired to obtain, whereby an 0-acyl group is introduced at least at carbon-3 of the molecule
exposing the solvolysis reaction products to actinic radiation in the presence of a photosensitizing agent
recovering the 1α-hydroxylated 0-acylated vitamin D product.

4,234,496

COMPLEX ORGANO-METALLIC COMPOUNDS OF BORON OR PHOSPHORUS

Samuel E. Harson, Warrington, England, assignor to Manchem Limited, Manchester, England

Filed May 22, 1979, Ser. No. 41,418

Claims priority, application United Kingdom, May 26, 1978, 23007/78

Int. Cl.³ A23J *7/00*; C07F *9/02*; C11C *3/00*

U.S. Cl. 260—403 **12 Claims**

1. Solid compounds comprising three atoms of a divalent metal selected from the group consisting of iron, cobalt, and manganese, linked through oxygen atoms to an atom selected

from the group consisting of a boron atom and a phosphorus atom having an oxo oxygen bonded thereto, and a monocarboxylic acid bonded thereto, and a monocarboxylic acid radical having 7 to 11 carbon atoms attached to each divalent metal atom, at least one of said monocarboxylic acid radicals having from 7 to 9 carbon atoms, and at least one other of said monocarboxylic radicals having 10 or 11 carbon atoms.

4,234,497

ISO-PALMITATE POLYOL ESTER LUBRICANTS

Milton L. Honig, Bronx, N.Y., assignor to Standard Lubricants, Inc., New York, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,387

Int. Cl.[3] C09F *5/08*; C10M *1/24*

U.S. Cl. 260—410.6 **10 Claims**

1. An iso-palmitate polyol ester lubricant base stock, comprising the reaction product of:

(a) one or more aliphatic polyhydric alcohols containing from 2 to 8 primary hydroxyl groups;

(b) a minor amount of iso-palmitic acid;

$$CH_3(CH_2)_5CH(CH_2)_7CH_3;\ \text{and}$$
$$\quad\quad\quad

stoichiometric ratio to the ammonia or alkylamine preheated in a pressure vessel at a temperature between 50° and 200° C. and thereafter carrying out the reaction at a temperature between 50° and 200° C.

4,234,503

METHOD OF PREPARING GAMMA AMINOPROPYL ALKOXY SILANES

Fritz-Robert Kappler, Troisdorf; Claus-Dietrich Seiler, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Dec. 21, 1978, Ser. No. 971,966
Int. Cl.³ C07F *7/10, 7/18*
U.S. Cl. 556—413 **10 Claims**

1. In a method of preparing γ-aminopropylalkoxysilanes of the formula

$$H_2N-CH_2-CH_2-CH_2-\underset{\underset{R_y'}{|}}{Si}(OR)_{3-y}$$

wherein R is an alkyl moiety with 1 to 4 carbon atoms and R′ is the methyl or phenyl moiety and y=0 or 1 or 2, by reacting γ-chloropropylalkoxysilanes with ammonia at elevated temperatures and under pressure, the improvement wherein the reaction takes place while the mixture is stirred at temperatures of between 50° and 90° C.

4,234,504

CARBONYLATION PROCESS

John E. Hallgren, Scotia, and William E. Smith, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,681
Int. Cl.³ C07C *68/00*
U.S. Cl. 260—463 **33 Claims**

1. A carbonylation process which comprises contacting a β-fluoroalkanol, carbon monoxide, a base, and the Group IIB element mercury present in an oxidation state greater than zero, and subsequently recovering at least a portion of a resulting β-fluoroaliphatic carbonate.

4,234,505

PROCESS FOR PREPARING CYANOHYDRIN ESTERS

James M. Photis, Ridgefield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 1, 1979, Ser. No. 80,954
Int. Cl.³ C07C *121/38, 121/46, 121/75*
U.S. Cl. 260—465 D **14 Claims**

1. A process for preparing cyanohydrin esters which comprises forming a reaction mixture of an acyl cyanide, a carboxylic acid anhydride and an alkali metal borohydride and reacting said reaction mixture at a temperature and for a time sufficient to form the cyanohydrin ester product of said acyl cyanide and carboxylic acid anhydride.

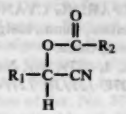
4,234,506

PROCESS FOR PREPARING CYANOHYDRIN ESTERS

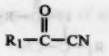
James M. Photis, Ridgefield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 1, 1979, Ser. No. 80,955
Int. Cl.³ C07C *121/38, 121/46, 121/75*
U.S. Cl. 260—465 D **9 Claims**

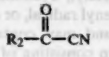
1. A process for preparing cyanohydrin esters represented by the formula:



which comprises reacting at least one acyl cyanide represented by the structure



with an alkali metal borohydride and at least one acyl cyanide represented by the structure:



wherein R_1 and R_2 can be the same or different and each independently represents alkyl, alkenyl, cycloalkyl, aryl, aralalkyl, alkylphenyl, diphenyl ether, or polyphenyl radical, or a radical made up of any combination thereof; and may contain an inert substituent selected from the group consisting of halogen, alkyl and alkoxy; the radical having a total number of carbon atoms ranging from 1 to about 30.

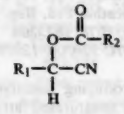
4,234,507

PROCESS FOR PREPARING CYANOHYDRIN ESTERS

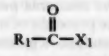
James M. Photis, Ridgefield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 1, 1979, Ser. No. 80,956
Int. Cl.³ C07C *121/38, 121/46, 121/75*
U.S. Cl. 260—465 D **9 Claims**

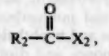
1. A process for preparing cyanohydrin esters represented by the formula:



which comprises reacting an alkali metal cyanide and an alkali metal borohydride with at least one acyl halide represented by the structure:



and at least one acyl halide represented by the structure:



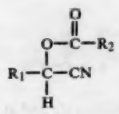
wherein R_1 and R_2 can be the same or different, and each represents an alkyl, alkenyl, cycloalkyl, aryl, aralalkyl alkylphenyl, diphenyl ether, or polyphenyl radical, or a radical made up of any combination thereof; and may contain an inert substituent selected from the group consisting of halogen, alkyl and alkoxy; the radical having a total number of carbon atoms ranging from 1 to about 30; and X_1 and X_2 each independently represent a bromide or chloride radical.

4,234,508
PROCESS FOR PREPARING CYANOHYDRIN ESTERS

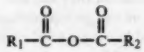
James M. Photis, Ridgefield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 1, 1979, Ser. No. 80,957
Int. Cl.³ C07C 121/38, 121/46, 121/75
U.S. Cl. 260—465 D 11 Claims

1. A process for preparing cyanohydrin esters represented by the formula



wherein R^1 and R^2 may be the same or different and each represents an alkyl, alkenyl, cycloalkyl, aryl, aralkyl, alkylphenyl ether or polyphenyl radical, or a radical made up of any combination thereof; and may contain an inert substituent selected from the group consisting of halogen, alkyl and alkoxy; said radical having a total number of carbon atoms ranging from 1 to about 30; which comprises reacting a carboxylic acid anhydride represented by the structure



wherein R_1 and R_2 have the aforedescribed meaning, with an alkali metal cyanide and an alkali metal borohydride.

4,234,509
PROCESS FOR THE MANUFACTURE OF FATTY ACID NITRILES AND GLYCEROL FROM GLYCERIDES, ESPECIALLY FROM NATURAL FATS AND OILS

Siegfried Billenstein, Burgkirchen; Bruno Kukla, Gendorf, and Herbert Stühler, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 933,955, Aug. 15, 1978, abandoned. This application Apr. 24, 1979, Ser. No. 32,753
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737607; Mar. 25, 1978, 2813204
Int. Cl.³ C07C 120/00, 120/08, 120/10
U.S. Cl. 260—465.2 9 Claims

1. A process for producing simultaneously glycerol and saturated or olefinically unsaturated fatty acid nitriles without isolating intermediates by treating fatty acid glycerides or mixtures of fatty acid glycerides with gaseous ammonia at elevated temperatures in the presence of catalysts, wherein the improvement comprises contacting the liquid fatty acid glyceride at temperatures of from about 220° to about 300° C. with a flow of at least 200 liters ammonia per kilogram of fatty acid glyceride per hour in the presence of metal salt of a carboxylic or sulfonic acid as a catalyst, wherein in said metal salt the metal cation is lead, cadmium, iron, cobalt, zinc, tin, titanium, zirconium, chromium, antimony, manganese, or nickel and the anion is selected from the group consisting of saturated aliphatic mono- and polycarboxylic acids; olefinically unsaturated aliphatic mono- and polycarboxylic acids; mono-, di-, and trialkylated benzene and naphthalene mono- and polycarboxylic acids; alkane mono- and disulfonic acids; fluorosubstituted alkane monosulfonic acids; monohydroxy-substituted alkane monosulfonic acids; mono-, di-, and trialkylated benzene- and naphthalene- mono- and polysulfonic acids; and (monocarboxy)alkyl and (dicarboxy)alkyl benzene and naphthalene mono- and polysulfonic acids; or mixtures of said catalysts; removing a product mixture containing said nitriles, glycerol, and water formed from the liquid fatty acid glycerides, and subjecting the product mixture to a phase separation into a nitrile phase and a glycerol/water phase.

4,234,510
RECOVERY OF ACRYLONITRILE OR METHACRYLONITRILE BY CONDENSATION

Hsin C. Wu, Parma, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Jun. 7, 1973, Ser. No. 367,840
Int. Cl.³ C07C 120/00, 120/14, 121/32
U.S. Cl. 260—465.3 9 Claims

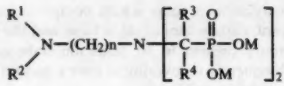
1. In the process for the recovery of acrylonitrile or methacrylonitrile obtained in the reactor effluent of ammoxidation reaction of propylene or isobutylene, the improvement comprising cooling the reactor effluent to a temperature between about 40° and about 100° C. using direct contact cooling wherein an aqueous stream is contacted with the reactor effluent in such a manner that little or none of the acrylonitrile or methacrylonitrile is condensed to obtain a gaseous stream containing acrylonitrile or methacrylonitrile and cooling the gaseous stream obtained using indirect contact cooling to condense and separate about 10 to about 90% of the acrylonitrile or methacrylonitrile from the gaseous stream.

4,234,511
DIALKYLAMINO-N,N-BIS(PHOSPHONOALKYLENE)ALKYLAMINES AND USE IN AQUEOUS SYSTEMS AS PRECIPITATION AND CORROSION INHIBITORS

John D. Buckman, Memphis, Tenn., assignor to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Jul. 26, 1979, Ser. No. 61,168
Int. Cl.³ C07F 9/38; C09K 3/00; C23F 11/10
U.S. Cl. 260—502.5 5 Claims

1. As a new composition of matter a compound having the formula



wherein R^1 and R^2 represent an alkyl group containing 1 to 4 carbon atoms, R^3 and R^4 represent hydrogen or an alkyl group containing 1 to 4 carbon atoms, M represents hydrogen, alkali metal or ammonium, and n is an integer varying from 2 to 6 and the hydrochloride salts thereof.

4,234,512
CYCLOPROPANE DERIVATIVES

Johannes Van Berkel, and Hendrik C. Kelderman, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 9, 1979, Ser. No. 55,857
Claims priority, application United Kingdom, Jul. 19, 1978, 30338/78; Jul. 19, 1978, 30340/78
Int. Cl.³ C07C 47/293, 43/305
U.S. Cl. 568—420 5 Claims

1. 2-(2,2-Dimethoxyethyl)-3,3-dimethylcyclopropanecarbaldehyde.

3. 2-[2-(2,2-Dihalovinyl)-3,3-dimethylcyclopropyl]ethanal dimethyl acetal wherein each halo independently is chloro, fluoro or bromo.

4,234,513

PROCESS FOR THE PREPARATION OF MONOARYL THIOUREAS

Theodor Papenfuhs, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 7, 1979, Ser. No. 36,687

Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2820321

Int. Cl.[3] C07C *157/09, 69/14, 69/78*

U.S. Cl. 564—26 6 Claims

1. In a process for the preparation of a monoaryl thiourea compound by reacting a salt of an arylamine with ammonium rhodanide or an alkali metal rhodanide in an aqueous medium, the improvement which comprises carrying out the reaction in a reaction mixture which at the start contains a higher amount by weight of the salt of the arylamine than of water and from 1 to 1.25 times the equivalent amount of the ammonium rhodanide or alkali metal rhodanide calculated on the arylamine, and does not contain any excess acid, and carrying out the reaction at a temperature which is below the boiling point of the reaction mixture by at least 5° C.

4,234,514

METHOD OF PREPARING KETOXIME CARBAMATES

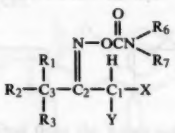
Russell Buchman, Madison, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Dec. 4, 1978, Ser. No. 966,389

Int. Cl.[3] C07C *131/00*

U.S. Cl. 564—255 3 Claims

1. A method of preparing compounds at a temperature from about 0° C. to about 150° C. of the formula:



where:

R_1=hydrogen, R_2R_3 or X;

R_2-R_3=lower alkyl, lower alkenyl, or lower alkynyl, with the proviso that R_2 and R_3 may be connected to form a cycloaliphatic ring;

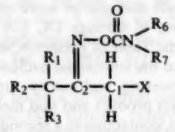
R_6-R_7=hydrogen, lower alkyl, lower alkenyl, or lower alkynyl;

X-Y=X and Y may be the same or different and each is selected from the group consisting of SR_8.S(O)R_8, SO_2R_8, OR_8, or NR_8R_9;

R_8=hydrogen, lower alkyl, lower alkenyl, lower alkynyl, or aryl; and

R_9=hydrogen or lower alkyl

which comprises halogenating a compound of the formula:



to form a halogenated intermediate, and reacting said intermediate with a compound of the formula HY in the presence of a hydrogen halide acceptor.

4,234,515

PREPARATION OF N,N-DIFLUOROAMINES

Derek H. R. Barton, London, England, and Robert H. Hesse, Cambridge, Mass., assignors to Research Institute for Medicine & Chemistry Inc., Cambridge, Mass.

Continuation of Ser. No. 591,762, Jun. 30, 1975, abandoned, which is a continuation of Ser. No. 373,732, Jun. 26, 1973, abandoned. This application May 9, 1978, Ser. No. 904,338

Claims priority, application United Kingdom, Jun. 27, 1972, 30128/72

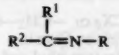
Int. Cl.[3] C07C *85/18*

U.S. Cl. 564—114 20 Claims

1. A process for the preparation of an N,N-difluoroamine of the formula

$$R—NF_2 \qquad I$$

where R represents a hydrogen atom or an organic group, comprising reacting a compound of the formula

 II

where R is as defined for formula I, R^1 represents an organic group and R^2 represents a hydrogen atom or an organic group with a fluorinating agent selected from the group consisting of elemental fluorine and hypofluorites in which the fluoroxy group is bonded to an inert electron attracting group; with the proviso that if neither R^1 nor R^2 is a group capable of releasing electrons the reaction is effected in the presence of a nucleophilic compound.

4,234,516

METHOD OF ISOMERIZING HUMULONE TO ISOHUMULONE BY CATALYTIC ACCELERATION WITH METAL SALTS

Horst Koller, Munich; Alfons E. Hartl, Germering near Munich, and Gerhard Kirchner, Grobenzell near Munich, all of Fed. Rep. of Germany, assignors to Atlantic Research Institute Limited, Nassau, The Bahamas

Continuation of Ser. No. 356,785, May 3, 1973, Pat. No. 3,952,061, which is a continuation-in-part of Ser. No. 725,458, Apr. 30, 1968, abandoned. This application Jun. 2, 1975, Ser. No. 582,774

The portion of the term of this patent subsequent to Jun. 10, 1992, has been disclaimed.

Int. Cl.[3] C07C *45/00*

U.S. Cl. 568—341 13 Claims

1. A method for preparing isohumulone products, comprising:

providing a mixture of (1) a salt productive in an aqueous medium of an anion and a cation, said anion being inert to the starting material and inert to the isohumulone products under the operating conditions of the present method, and said cation being an element selected from the group consisting of Group II*a* or II*b* elements, Fe group elements, cerium and manganese, (2) humulone or a humulone-containing material, and (3) a liquid medium, inert to the starting materials and to the isohumulone produced under the operating conditions of the present method, said liquid medium being one in which said salt dissociates to form said anion and said cation and said humulone or humulone-containing material dissociates to form humulate anion; and

isomerizing at an elevated temperature, at a pH below 9 and greater than that pH at which humulone forms humulate anion in solution;

wherein said salt is present in an amount sufficient to accelerate said isomerization.

4,234,517
2-(2',2'-DIHALOVINYL)-CYCLOBUTANONES AND 2-(2',2',2'-TRIHALOETHYL)-CYCLOBUTANONES

Hans Greuter, Eiken; Pierre Martin, Basel, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

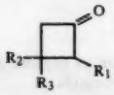
Division of Ser. No. 891,413, Mar. 29, 1978, abandoned. This application Mar. 16, 1979, Ser. No. 21,273

Claims priority, application Switzerland, Mar. 31, 1977, 4072/77; Feb. 23, 1978, 1975/78

Int. Cl.³ C07C *49/39*

U.S. Cl. 568—381 **2 Claims**

1. A compound of the formula I



(I)

wherein

R_1 represents —CH=CX_2 or —CH_2—CX_3, and X in each case represents chlorine or bromine,

one of R_2 and R_3 represents methyl and the other hydrogen or methyl, or

R_2 and R_3 together represent alkylene having 2–4 C atoms.

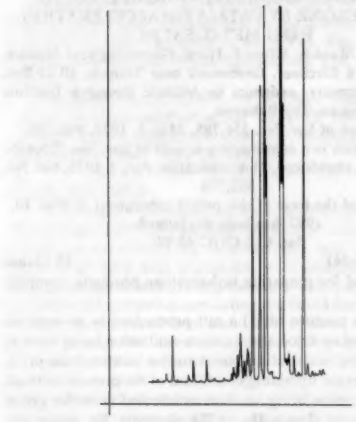
4,234,518
KETONES AND ORGANOLEPTIC USES THEREOF

Takao Yoshida, West Long Branch, and John B. Hall, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 932,649, Aug. 10, 1978, Pat. No. 4,169,109. This application Jun. 7, 1979, Ser. No. 46,390

Int. Cl.² C07C *45/00*

U.S. Cl. 568—377 **10 Claims**



1. A mixture of 3-methyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-3-penten-2-one; 3-methyl-5-(2,6,6-trimethyl-2-cyclohexen-1-yl)-3-penten-2-one; 3-methyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-4-penten-2-one; 3-methyl-5-(2,6,6-trimethyl-2-cyclohexen-1-yl)-4-penten-2-one; 6-(2,6,6-trimethyl-1-cyclohexen-1-yl)-4-hexen-3-one; 6-(2,6,6-trimethyl-2-cyclohexen-1-yl)-4-hexen-3-one and 6-(2,6,6-trimethyl-1-cyclohexen-1-yl)-5-hexen-3one; 6-(2,6,6-trimethyl-2-cyclohexen-1-yl)-4-hexen-3-one and 6-(2,6,6-trimethyl-2-cyclohexen-1-yl)-5-hexen-3-one prepared by intimately admixing a mixture of 2,6,6-trimethyl-1-cyclohexene acetaldehyde and 2,6,6-trimethyl-2-cyclohexene acetaldehyde, methyl ethyl ketone and zinc acetate dihydrate and heating the resulting mixture at a temperature of about 190° C. for a period of about 8 hours and then distilling the resulting product at temperatures in the range of 116°–121° C. at 1.3 mm Hg pressure.

4,234,519
RECOVERY OF METHACROLEIN

Neil Yeoman, Merick, and Sidney S. Stern, New York, both of N.Y., assignors to Halcon Research and Development Corp., New York, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,824

Int. Cl.³ C07C *45/35, 47/21*

U.S. Cl. 568—492 **5 Claims**

1. A process for recovering methacrolein from effluent gases produced by the vapor-phse catalytic oxidation of isobutylene and/or tertiary butyl alcohol with molecular oxygen in the presence of a catalyst at a temperature of 300°–500° C. and supplying said methacrolein to a subsequent catalytic oxidation to methacrylic acid comprising:

(a) cooling and condensing said effluent gases by direct contact with water to provide a gas stream and an aqueous solution of methacrolein;

(b) stripping said aqueous solution of (a) with recycle gas vapors derived from the recovery of said methacrylic acid precedent to the use of said vapors in said subsequent catalytic oxidation of methacrolein to methacrylic acid to desorb substantially all of the methacrolein absorbed in (a), whereby said methacrolein is added to said vapors as feed to said subsequent oxidation.

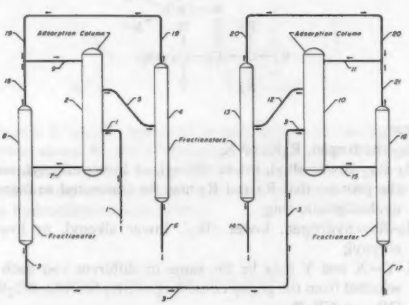
4,234,520
PROCESS FOR THE SEPARATION OF ISOMERS OF CHLORONITROBENZENE

James W. Priegnitz, Elgin, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 14,656, Feb. 23, 1979. This application Apr. 16, 1979, Ser. No. 30,407

Int. Cl.³ C07C *79/12*

U.S. Cl. 568—937 **9 Claims**



1. A process for separating the ortho, meta and para isomers of chloronitrobenzene from a feed mixture comprising said isomers, which process comprises contacting in a first adsorption stage at adsorption conditions said mixture with an adsorbent comprising a type X or type Y zeolite containing at the exchangeable cationic sites one or more cations selected from the group consisting of Groups IA, IIA and the transition metals of the Periodic Table of Elements, selectively adsorbing the ortho-isomers to the substantial exclusion of the meta and para isomers, recovering high-purity ortho-chloronitrobenzene as a first extract product and said meta and para isomers as a raffinate stream, contacting in a second adsorption stage at adsorption conditions said raffinate stream with an adsorbent selective for either said meta or para isomer and comprising a type X or type Y zeolite containing at the exchangeable cationic sites one or more cations selected from the group consist-

ing of Group IA, IIA and the transition metals of the Periodic Table of Elements, selectively adsorbing said meta or para isomer as the selected isomer, to the substantial exclusion of the non-selected isomer and recovering high-purity selected isomer as a second extract product and high-purity non-selected isomer as a raffinate product.

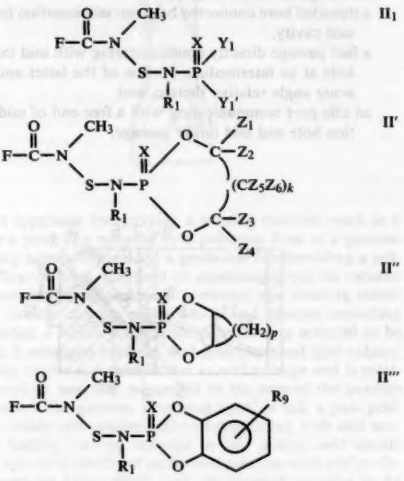
4,234,521

PHOSPHORUS DERIVATIVES OF AMINOTHIOCARBAMOYL HALIDES

Stephen J. Nelson, Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 1, 1979, Ser. No. 43,276
Int. Cl.³ C07F 9/24
U.S. Cl. 260—937 **72 Claims**

1. A compound having the formula selected from the group consisting of:



wherein R_1 is selected from the group consisting of lower-alkyl, phenyl, substituted phenyl, phenyl lower-alkyl, and cycloalkyl; X is oxygen or sulfur; Y_1 and Y_1' are the same or different and are selected from the group consisting of lower-alkyl, lower-alkoxy, lower-alkylthio, cycloalkyl, phenyl, substituted phenyl, phenoxy, substituted phenoxy, thiophenoxy, and substituted thiophenoxy; wherein Z_1 through Z_6 are the same or different and are selected from the group consisting of hydrogen, methyl and ethyl; and k is 0 or 1, p is three or four and R_9 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy an halogen.

4,234,522

VARIABLE DIFFUSER FOR CARBURETORS

Pierre Fontanet, Versailles, and Georges Desjardins, Rueil-Malmaison, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Continuation of Ser. No. 745,836, Nov. 30, 1976, abandoned. This application Nov. 3, 1978, Ser. No. 957,448
Claims priority, application France, Dec. 3, 1975, 75 36951
Int. Cl.³ F02M 9/12
U.S. Cl. 261—23 A **2 Claims**

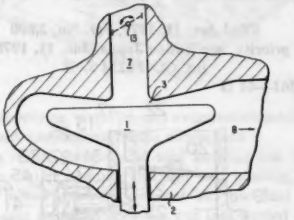
1. In a carburetor body of an internal combustion engine, a variable section, sonic flow diffuser, comprising:

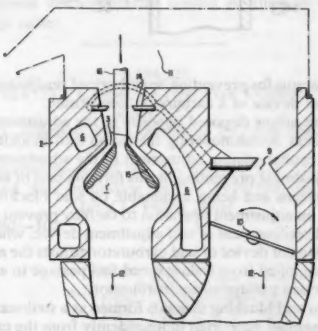
means for defining a circular intake passage in the carburetor body and a circular, fixed, divergent wall into which said circular intake passage opens;

an obstacle in the form of a body of revolution and of a maximum diameter greater than that of said intake passage being disposed in said carburetor body in said circular, fixed, divergent wall, coaxial with said divergent wall and said intake passage;

means for adjusting the position of said obstacle along the axial path of said intake passage and said circular divergent wall;

such that a sonic flow, circular, divergent nozzle is formed, the annular throat of which is formed between the exit periphery of said intake passage and the nearest portion of the surface of said obstacle, and the variation in the gas flow cross-section of which is due to the variation of the radius of such section with respect to the flow axis wherein said obstacle has a plane circular surface oriented perpendicular to the axis of said intake passage, facing said passage, the fixed circular wall of said carburetor opposite said surface diverging slightly with respect thereto and wherein said intake passage forms the first barrel of a two-barrel carburetor, the air flow of which is controlled by the axial adjustment of said obstacle, said means for adjusting the position of said obstacle comprising an axial





control rod extending through the air filter of said carburetor for axially adjusting said obstacle.

2. In a carburetor body of an internal combustion engine, a variable section, sonic flow diffuser, comprising:

means for defining a circular intake passage in the carburetor body and a circular, fixed, divergent wall into which said circular intake passage opens;

an obstacle in the form of a body of revolution and of a maximum diameter greater than that of said intake passage being disposed in said carburetor body in said circular, fixed, divergent wall, coaxial with said divergent wall and said intake passage;

means for adjusting the position of said obstacle along the axial path of said intake passage and said circular divergent wall;

such that a sonic flow, circular, divergent nozzle is formed, the annular throat of which is formed between the exit periphery of said intake passage and the nearest portion of the surface of said obstacle, and the variation in the gas flow cross-section of which is due to the variation of the

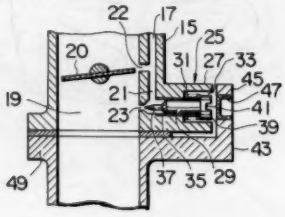
radius of such section with respect to the flow axis, the fixed ciruclar wall of said carburetor opposite said surface diverging slightly with respect thereto and wherein said intake passage forms the first barrel of a two-barrel carburetor, the air flow of which is controlled by the axial adjustment of said obstacle, said means for adjusting the position of said obstacle comprising an axial control rod extending through the air filter of said carburetor for axially adjusting said obstacle wherein said obstacle has radial grooves of increasing flow section disposed on its circular diverging surface forming a wall of said nozzle, allowing a minimum sonic intake flow to be maintained even when said obstacle is drawn by said control rod up against the wall of said carburetor to thereby close said nozzle throat.

4,234,523

ADJUSTMENT PREVENTION MECHANISM FOR CARBURETOR

Keiichi Onuki, Hitachi; Tohru Nakagawa, Mito, and Shigeyuki Kenma, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 11, 1979, Ser. No. 2,800
Claims priority, application Japan, Jan. 11, 1978, 53-1139
Int. Cl.³ F02M *3/08*
U.S. Cl. 261—41 D **8 Claims**



1. Apparatus for preventing unauthorized readjustment of an adjustment device of a carburetor, comprising:

blocking means disposed opposite to the adjustment device,

adjustment accommodating means on said blocking means for accommodating adjustment of the adjustment device,

and adjustment preventing means forming part of said blocking means and being mountable on said blocking means after an adjustment operation to thereby prevent unauthorized readjustment of said adjustment device, wherein said adjustment device of said carburetor adjusts the amount of fuel supplied from a slow speed fuel passage to an air-fuel induction passage of the carburetor,

wherein said blocking means is formed as a stationary covering member supported independently from the carburetor body and disposed so as to face an operating portion of the adjustment device of the carburetor body,

wherein the adjustment accommodating means is a hole through said covering member for accommodating insertion and operation of an adjustment means therethrough, and

wherein said adjustment preventing means is a plug rigidly insertable in said hole to prevent the usual users from operating the adjustment means.

4,234,524

IDLE ADJUSTING SCREW IN CARBURETOR

Hisaharu Arai, Nagoya, Japan, assignor to Aisan Industry Co., Ltd., Aichi, Japan

Filed Apr. 26, 1979, Ser. No. 33,665
Claims priority, application Japan, May 9, 1978, 53/54603
Int. Cl.³ F02M *3/08*
U.S. Cl. 261—41 D **6 Claims**

1. In an idle adjusting screw device for carburetors having a mixture adjusting screw fitted into a carburetor body such that a needle portion at the forward end section of the screw is in an idle port of the carburetor body, the improvement wherein

the screw consists of:

an enlarged head portion,

a rod portion having a smaller diameter than that of said head portion,

a threaded portion connected to and between said head portion and said rod portion and having a diameter intermediate to that of said head portion and that of said rod portion,

said threaded portion forming a lower end step surface connecting said rod portion, and

a needle portion narrowing from a bottom free end of said rod portion;

a carburetor body defining:

an intake passage,

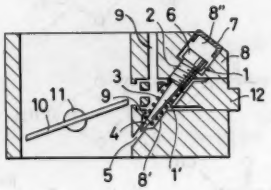
a cavity having an outer free end portion,

an elongated insertion hole,

a threaded bore connected between said insertion hole and said cavity,

a fuel passage directly communicating with said insertion hole at an intermediate portion of the latter and at an acute angle relative thereto, and

an idle port communicating with a free end of said insertion hole and said intake passage,



said cavity, said insertion hole, said threaded bore and said idle port are integrally formed in said carburetor body and are aligned defining an inclined common axis,

said screw is fitted into said carburetor body such that said needle portion extends into said idle port, said rod portion extends in said insertion hole, said threaded portion engages in said threaded bore, and said head portion is positioned completely disposed inside of said cavity spaced from said outer free end portion,

said insertion hole has a lower end narrowing surface connecting said insertion hole with said idle port,

a coil compression spring is disposed around said rod portion in said insertion hole engaging said step surface of said threaded portion and said narrowing surface of said insertion hole so as to urge said screw in a direction counter to a screw insertion direction, said spring being exposed to said fuel passage,

a detachable closed plug fitted in said outer free end portion of said cavity extending solely into said cavity so as to cover said head portion of said screw,

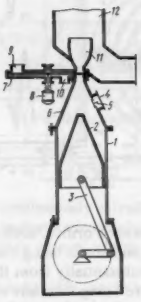
said head portion has a special shape constituting means for permitting said screw to be turned only with a specially correspondingly shaped tool,

said plug and said special shape head portion constituting double means for preventing random turning of said screw.

4,234,525
APPARATUS FOR SPRAYING FLUID AND PASTE-LIKE MATERIALS

Georgy P. Piterskikh, ulitsa Garibaldi, 4, korpus 1, kv. 11; Stanislav A. Sukhov, Gostinichny proezd, 4a, kv. 71; Vladimir B. Slobodchikov, ulitsa Tukhachevskogo, 33, kv. 21, and Gleb F. Rybalchenko, ulitsa Festivalnaya, 12, kv. 20, all of, Moscow, U.S.S.R.

Filed Mar. 13, 1979, Ser. No. 20,082
Int. Cl.[3] B05B *9/043*; B05C *1/14*
U.S. Cl. 261—89 **7 Claims**



1. An apparatus for spraying a starting material, such as a fluid or a paste-like material by a pulsating flow of a gaseous atomizing agent, comprising: a generator for providing a pulsating flow of a gaseous fluid or atomizing agent; an exhaust pipe communicating with said generator and forming therewith a circular passage along which said gaseous atomizing agent is fed; a nozzle for retaining the starting material to be sprayed is arranged between said generator and said exhaust pipe; said nozzle is perpendicular to said passage and is rotatable about an axis that is parallel to the axis of the passage along which the gaseous atomizing agent is fed; a pipe positioned outside said passage and communicating with said nozzle for feeding starting material to said nozzle; said nozzle having non-perforated and perforated portions with said perforated portions being filled with the starting material to be sprayed; and said nozzle, when rotated into said circular cross-section of said passage during the pause between successive pulsations of said gaseous atomizing agent, is sealed about the peripheral edge of said cross section of said passage with a sealing device.

4,234,526
EVAPORATIVE COOLER

Frederick G. Mackay, Tarzana, and Spencer L. Mackay, Canoga Park, both of Calif., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

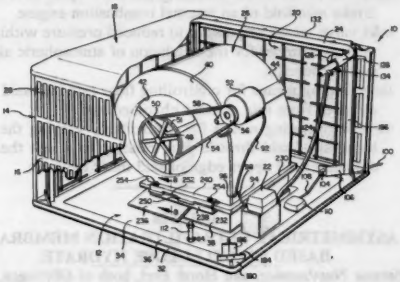
Filed Jan. 9, 1979, Ser. No. 2,125
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—106 **7 Claims**

1. An evaporative cooler comprising in combination:

an outer housing comprising (a) a one-piece, frameless shell having open top and bottom ends and first and second pairs of opposed side walls having openings for admitting air into said housing, adjacent ones of said side walls defining corners of said shell, (b) a bottom pan closing the open bottom end of said shell, and (c) a top cover adapted to close the open top end of said shell;

means comprising a plurality of vertical rails generally T-shaped in cross section, each of said rails being secured in said shell at a corresponding one of said corners and angled with respect to the side walls adjacent said corner to define a V-shaped track for each of the adjacent side walls at said corner, the rails at adjacent ones of said corners cooperating to define opposed V-shaped tracks between adjacent corners of said shell, said opposed tracks being spaced inwardly from said side walls;

a plurality of evaporative media means adapted to be received through the open top end of said shell in slidable engagement between corresponding ones of said opposed V-shaped tracks and held thereby in spaced relation to the corresponding side walls, each of said evaporative media means having a pair of peripheral track engaging sides having V-shaped outer surfaces complementary to said V-shaped tracks;



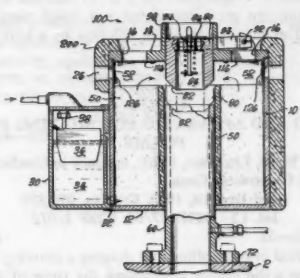
means for supplying water to said evaporative media means to wet said evaporative media means; and

air moving means mounted in said housing and having a discharge outlet opening through said housing, said air moving means drawing ambient air into said housing through said side wall openings and said wetted evaporative media means to cool said air by evaporation of water from said wetted evaporative media means, said air moving means discharging the cooled air through said discharge outlet.

4,234,527
EVAPORATIVE CARBURETOR FOR COMBUSTION ENGINES

Richard D. Anderson, 419 Columbiana Dr., San Dimas, Calif. 91773

Continuation-in-part of Ser. No. 896,934, Apr. 17, 1978, abandoned. This application Aug. 21, 1979, Ser. No. 68,462
Int. Cl.[3] F02M *21/04*
U.S. Cl. 261—102 **9 Claims**



1. An improved evaporative carburetor for internal combustion engines operating on liquid gasoline fuel, comprising:

an annular evaporative chamber defined by concentric inner and outer cylinders extending upwardly from a baseplate sealingly encompassing the gap between the cylinders, with said inner cylinder extending upwardly through the baseplate to an elevation below the upper edge of the outer cylinder,

cover plate means sealingly affixed above the upper edge of the outer cylinder,

a mixing chamber defined by said outer cylinder and said cover plate means, superposed on said evaporative chamber,

fuel metering means to maintain a predetermined fuel level in said annular chamber,

wick means in the annular evaporative chamber extending from close proximity to said baseplate to an elevation no higher than the upper edge of said inner cylinder,

manifold means interconnecting the inner cylinder with the intake manifold of an internal combustion engine,

inlet valve means responsive to reduced pressure within said mixing chamber for the admission of atmospheric air into said carburetor,

throttle plug means for controlling flow rate into said inner cylinder from said annular chamber, and

throttle operating means for controllably varying the axial location of said throttle plug relative to a seat therefor, defined in the upper edge of said inner cylinder.

4,234,528

ASYMMETRICAL ULTRAFILTRATION MEMBRANE BASED ON CELLULOSE HYDRATE

Dietmar Nussbaumer, and Horst Perl, both of Göttingen, Fed. Rep. of Germany, assignors to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

Filed Apr. 10, 1979, Ser. No. 28,804

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1978, 2816085

Int. Cl.[3] **B01D** *13/00, 31/00;* **B29D** *27/04*

U.S. Cl. 264—41 **13 Claims**

10. A process for the production of an asymmetrical dry ultrafiltration membrane, comprising:

preparing a casting solution consisting essentially of:

8 to 20% by weight of cellulose acetate comprising cellulose triacetate or a mixture of cellulose triacetate and cellulose diacetate,

1 to 30% by weight, based on total solid content, of hydrophobic silicic acid,

acetone and dioxane at a ratio of 2:1 to 1:2 with respect to each other, and

0.8:1 to 4:1, based on the solid content, of a lower alkyl amide;

casting the membrane according to the precipitating bath process using ice water as precipitating agent, wherein prior to the precipitation in ice water the cast membrane is subjected to evaporation for 2 to 90 seconds; and

saponifying the precipitated but not dried membrane for several minutes in an alkali solution to a hydrate membrane.

4,234,529

METHOD AND APPARATUS FOR SHAPING PLASTIC FOAMS

Arthur L. Phipps, Los Osos, Calif., assignor to Condec Corporation, Old Greenwich, Conn.

Filed Dec. 18, 1978, Ser. No. 970,377

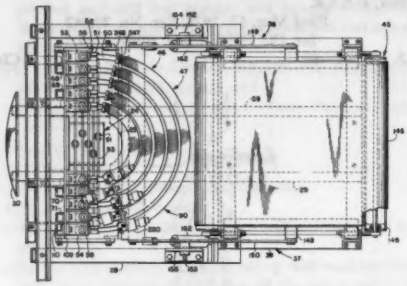
Int. Cl.[2] **B29D** *27/00;* **B29F** *3/012*

U.S. Cl. 264—51 **69 Claims**

1. A method of controlling and shaping a foaming extrudate exiting from a die orifice comprising the steps of adjustably positioning opposed sets of rolls each on opposite sides of the extrudate immediately downstream of the die orifice, and driving the rolls of at least one set for controlled rotation independently of the other rolls of said one set, said rolls being arcuate to extend substantially transversely of the path of the extrudate, and maintaining the plane of curvature of each roll parallel to the extrudate flow.

13. In combination, a foam extrusion die having an orifice therein, shafts on opposite sides of the extrudate path and downstream of such orifice, and a plurality of thin wafers rotatably mounted on each shaft operative to form the extrudate as it is extruded from such orifice.

65. In combination, an extrusion die having an orifice therein, shafts on opposite sides of the extrude path and downstream of such orifice, and a plurality of thin wafers on said shafts rotatably mounted thereon operative to form the extrud-



ate as it is extruded from such orifice, such orifice being in the form of an arcuate slot, said shafts being also arcuate and each having a radius struck substantially from the center of curvature of such orifice, there being two sets of arcuate shafts on opposite sides of the extrudate path, and the plane of curvature of each set of arcuate shafts being parallel to the plane of curvature of the die orifice.

4,234,530

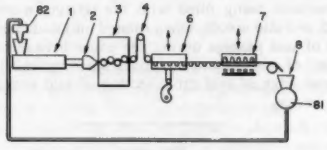
METHOD FOR THE MANUFACTURE OF THIN-WALLED SHAPED ARTICLES OF CRYSTALLINE THERMOPLASTIC MATERIAL

Alfons W. Thiel, Uferstrasse 15, Mainz, and Barbara Geppert, Schonbergstrasse 75, Wiesbaden, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 818,876, Jul. 25, 1977, abandoned. This application Sep. 27, 1978, Ser. No. 946,393

Int. Cl.[3] **B29F** *3/08*

U.S. Cl. 264—151 **18 Claims**

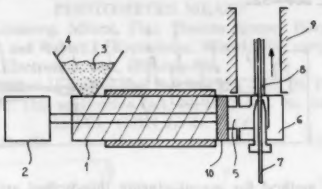


1. A method for manufacturing thin-walled articles from crystalline thermoplastic material by thermoforming in a web or sheet of said thermoplastic material while reducing the web or sheet thickness, said thermoplastic material having a critical crystalline melting temperature range and said method further including a temperature conditioning of said web or sheet to suitable temperature conditions for thermoforming and cutting out the shaped articles from said web or sheet, characterized thereby that said temperature conditioning involves providing at the inner core of said web or sheet a temperature higher than the upper limit of said critical crystalline melting temperature range and providing at the outer surface regions of said web or sheet a temperature lower than the lower limit of said critical crystalline melting temperature range, and that in said thermoforming step the said thermoplastic material in the said core of the web or sheet or in the said shaped article wall, respectively, in combination with the said reduction in thickness of said web or sheet and subsequently of said reduction in thickness, is rapidly cooled down through the said critical crystalline melting temperature range while growth of crystals in the said core material is controlled.

4,234,531
METHOD FOR EXTRUDING A CROSS-LINKED MATERIAL

Robert Jocteur, Moret sur Loing, France, assignor to Societe Industrielle de Liaisons Electriques-Silec, Paris, France

Filed Feb. 1, 1979, Ser. No. 8,574
Claims priority, application France, Feb. 2, 1978, 78 02942
Int. Cl.[3] B29F *3/10*
U.S. Cl. 264—174 11 Claims



1. A method for continuously extruding in a closed environment an insulating material cross-linked by the separate addition of a cross-linking agent, which method comprises the following steps:

(1) passing a cross-linkable insulating material through an extrusion machine provided adjacent its outlet end with a filtering means and at said outlet end with an extrusion head, said extrusion machine being heated to a temperature between about 200° and 220° C., said temperature being about the maximum temperature admissible for said material, so as to bring said material in a substantially fluid condition;

(2) cooling the thus filtered material to a temperature between about 140° and 150° C. which temperature is slightly lower than the reaction temperature of the cross-linking agent;

(3) injecting said cross-linking agent into said thus cooled material; and

(4) conveniently mixing said cross-linkable material and said cross-linking agent; and thereafter

(5)elevating the temperature of the mixture of step (4) to a temperature about the maximum temperature admissible for the extrusion of said extrudate before it leaves said extrusion head.

4,234,532
METHOD OF MANUFACTURING POLYESTER FILMS

Masahiko Motegi, Hikone; Ikukazu Kimata, Shiga, and Saburo Fujita, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

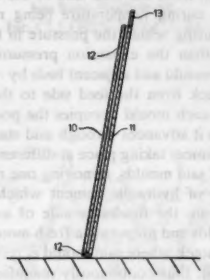
Filed Aug. 14, 1979, Ser. No. 66,451
Claims priority, application Japan, Aug. 15, 1978, 53-99387
Int. Cl.[3] B29C *17/02, 25/00*
U.S. Cl. 264—235.8 26 Claims

1. In a process for preparing highly tensilized polyester film having F-5 values over 14 kg/mm^2 in both MD and TD, the steps which comprises stretching a polyester film to an extent of at least 2.6 times its dimensions in MD and TD, simultaneously stretching the resulting film in the range of 1.05 to 1.9 times its dimensions in MD and 1.0 to 1.9 times its dimensions in TD at a linear rate of stretch speed under 8,000 percent per minute at a temperature between $T_g+10°$ C. and $T_m-40°$ C., and heat setting said film at a temperature between $T_g+50°$ C. and $T_m-10°$ C.

4,234,533
METHOD OF BONDING SPACED SHEETS BY MOLDING RESIN THEREBETWEEN

James W. Langlands, Glasgow, Great Britain, assignor to Mary Frances Theresa Langlands, Glasgow, Great Britain

Continuation-in-part of Ser. No. 895,637, Apr. 12, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,427
Claims priority, application New Zealand, Oct. 31, 1978, 188781
Int. Cl.[2] B32B *31/06*
U.S. Cl. 264—261 10 Claims

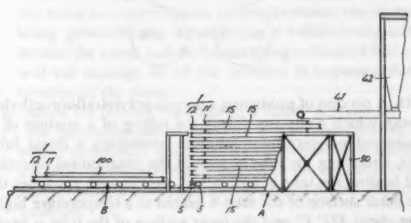


1. A method of producing a laminate comprising placing a pair of sheets of frangible material in face-to-face relationship, introducing between the sheets a liquid which on solidifying forms a polymer of greater resistance to fracture than the sheets and adheres to the sheets, forming around the periphery of the sheets a continuous tape-like barrier to passage of the liquid thereby to retain the liquid between the sheets, wherein at least part of the barrier is gas-permeable, expelling air from the intersheet space through the barrier so as to cause the liquid to fill the intersheet space, and solidifying the liquid to form a bonded laminate.

4,234,534
METHOD AND APPARATUS FOR MANUFACTURING ARTICLES OF HYDRAULIC SUBSTANCES

Yasuro Ito, No. 4-38-16, Numabukuro, Nakano-ku, Tokyo, Japan; Hideharu Kaga, Tokyo, Japan; Yasuhiro Yamamoto, Kawasaki, Japan, and Tadayuki Sumita, Tokyo, Japan, assignors to Yasuro Ito and Taisei Corporation, both of Tokyo, Japan

Continuation of Ser. No. 558,165, Mar. 13, 1975, abandoned. This application Apr. 25, 1978, Ser. No. 899,849
Claims priority, application Japan, Mar. 13, 1974, 49/28025; Feb. 14, 1975, 50/19736[U]; Feb. 14, 1975, 50/19737[U]; Feb. 17, 1975, 50/18709; Feb. 25, 1975, 50/23035
Int. Cl.[3] B28B *1/24*
U.S. Cl. 264—328.8 32 Claims



1. A continuous method of sequentially manufacturing articles made of hydraulic cement wherein a plurality of moulds are vertically stacked with a plurality of hollow beds alter-

nately disposed therebetween, said stack having a feed side and a discharge side, said moulds being interconnected for resisting pressure changes and wherein sealing members are interposed between said beds and the moulds throughout the stack for air-tightly closing said moulds, said method consisting essentially of introducing the hydraulic cement into said mould at the feed side of the stack by utilizing the pressure difference between the inside and the outside of the mould, introducing a heating medium into said hollow beds surrounding said moulds for gradually uniformly and indirectly heat curing the poured hydraulic cement from the feed side of the discharge side of said stack, said curing temperature being rapidly increased above 60° C., during which the pressure in the mould is incrreased higher than the expansion pressure of the cement, advancing each mould and adjacent beds by one step at a time through said stack from the feed side to the discharge side thereof, so that each mould occupies the position of the preceding mould as it advances through said stack, the curing of said hydraulic cement taking place at different stages throughout said stack of said moulds, removing one mould containing an article made of hydraulic cement which has been sufficiently cured from the discharge side of said stack of said plurality of moulds and preparing a fresh mould and bed at the feed side of the stack where said mould is recharged with said hydraulic cement, thus continuously manufacturing said articles.

4,234,535

PROCESS FOR PRODUCING POROUS POLYTETRAFLUOROETHYLENE TUBINGS

Koichi Okita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

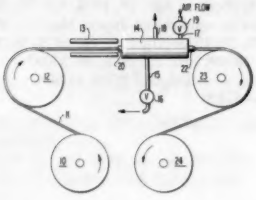
Continuation of Ser. No. 853,792, Nov. 21, 1977, abandoned, which is a division of Ser. No. 751,876, Dec. 17, 1976, Pat. No. 4,082,893. This application Jun. 11, 1979, Ser. No. 47,470

Claims priority, application Japan, Apr. 29, 1976, 51/49671; Dec. 17, 1977, 52/155226

The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—519 **11 Claims**



11. A process of producing a porous polytetrafluoroethylene tubing which comprises forming a tubing of a mixture of an unsintered polytetrafluoroethylene containing a liquid lubricant, stretching the tube at least in the longitudinal direction, and heating the tube in a stretched state in such a manner that the outer surface of the tube is heated at a temperature higher than about 327° C. and the inner surface of the tube is heated at a temperature lower than the temperature of the outer surface of the tube, said heating being carried out in a manner such that only the outer surface of the tube is sintered and the inner surface of the tube remains unsintered.

4,234,536

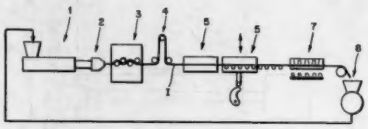
METHOD FOR THE MANUFACTURE OF THIN-WALLED SHAPED ARTICLES OF CRYSTALLINE THERMOPLASTIC MATERIAL

Alfons W. Thiel, Uferstrasse 15, Mainz, and Barbara Geppert, Schonbergstrasse 75, Wiesbaden, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 818,876, Jul. 25, 1977, abandoned. This application Sep. 27, 1978, Ser. No. 946,392

Int. Cl.³ B29D *7/20;* **B29F** *3/08*

U.S. Cl. 264—522 **18 Claims**



1. A method for manufacturing thin-walled articles from crystalline thermoplastic material by thermoforming the articles in a web or sheet of said thermoplastic material and removing the shaped articles from said web or sheet, said thermoplastic material having a critical crystalline melting temperature range with a lower limit temperature T_C and an upper limit temperature T_M and said method further including temperature conditioning of said web or sheet for thermoforming, characterized in that said temperature conditioning involves at least two steps; namely:

(a) developing by heating and/or cooling a preliminary temperature profile across the thickness of said web or sheet in which the core material of the web or sheet is at a temperature close to but lower than the critical crystalline melting temperature range of the said crystalline thermoplastic material and wherein said core is elastically deformable and the outer surface regions of the web or sheet are at lower temperatures than the core material and not thermally formable; and

(b) developing a final temperature profile for the thermoforming step by reheating one or both of said outer surface regions of said web or sheet to a temperature within said critical crystalline melting range whereby the said crystalline thermoplastic material of the outer surface regions becomes elastically deformable, whereas the said core material is retained in an elastically deformable state at a temperature adjacent to but lower than said critical crystalline melting temperature range.

4,234,537

STERILIZATION OF PARTICULATE SOLID MATERIALS

Albert C. Hersom; John E. Brittain, both of Beaconsfield, and Raymond Darlington, Crawley, all of England, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed May 17, 1978, Ser. No. 906,775

Claims priority, application United Kingdom, Dec. 23, 1977, 53759/77

Int. Cl.³ A23L *3/16;* **A61L** *2/06, 2/26*

U.S. Cl. 422—26 **11 Claims**

1. A batch process for the sterilization of particulate solid materials, in which a batch of particulate solid material to be sterilized is introduced with a small amount of lubricant liquid into a rotary vessel shaped so that rotation of the vessel imparts a tumbling action to the solid material; the solid material is heated in the vessel by direct introduction of pressurized steam into the vessel to condense therein while rotating the vessel to subject the material to a tumbling action; additional lubricant liquid is added to the heated solids by injection under pressure into the pressurized vessel at a temperature in excess of the temperature of the solids and above the atmospheric boiling temperature of the lubricant liquid but below the boiling tem-

perature corresponding to the pressure in the vessel; the lubricant liquids and solid material are held at a sterilization temperature while maintaining the tumbling action; and the sterilized solid material is withdrawn from the vessel under aseptic conditions.

4,234,538

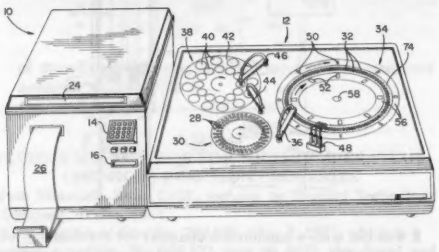
APPARATUS FOR MONITORING CHEMICAL REACTIONS AND EMPLOYING MOVING PHOTOMETER MEANS

Guenter Ginsberg, Miami, Fla.; Thomas Horne, Harpenden, England, and Robert L. Kreiselman, Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 808,168, Jun. 20, 1977, abandoned. This application Oct. 28, 1977, Ser. No. 846,337

Int. Cl.[2] G01N *21/24, 1/14*

U.S. Cl. 422—64 **12 Claims**



1. Apparatus for monitoring chemical reactions occurring in a plurality of liquid or the like sample substances carried in a plurality of respective cuvettes whose walls are at least to some extent capable of transmitting radiant energy which comprises:

A. support means,

B. a rotor mounted on said support means for rotation thereon on an axis,

C. a turntable mounted coaxially with the rotor for rotation relative to said support means, a plurality of radiant-energy-transmissive cuvettes mounted to the turntable and disposed in a circular arrangement coaxially with said axis and adapted to have sample substances producing chemical reactions carried in at least some of said cuvettes,

D. first drive means for rotating the turntable on its axis in a first program of rotation whereby the cuvettes describe an annular path as the turntable rotates,

E. second drive means for rotating the rotor on said axis in a second program of rotation in which the number of total revolutions of the rotor for a given period of time is greater than the number of revolutions of the turntable for the same period of time,

F. photometer means mounted on the rotor and defining at least one beam path for radiant energy which extends at least through said annular path such that the beam path includes and traverses at least a portion of the sample substance which may be contained in any of said cuvettes which intersects such beam path during rotation of the turntable,

G. the photometer means including means responsive to any radiant energy projected along said beam path to produce electrical signals as the cuvettes intersect the beam path, which signals are related to chemical conditions of the sample substances, if any, which may be contained in said cuvettes, there being two radiant energy detectors and means for dividing the beam path into two parts and directing the parts through different strata of the cuvettes,

H. means for generating usable data from any such signals, and

I. means for coupling at most all of the electrical signals from said photometer means to said data generating means.

4,234,539

APPARATUS FOR MONITORING CHEMICAL REACTIONS AND EMPLOYING MOVING PHOTOMETER MEANS

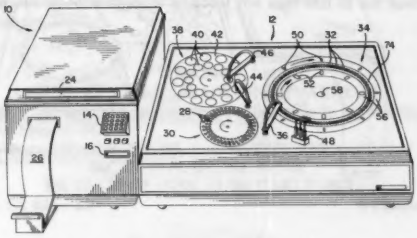
Guenter Ginsberg, Miami, Fla.; Thomas Horne, Harpenden, England, and Robert L. Kreiselman, Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of Ser. No. 846,337, Oct. 28, 1977, which is a continuation-in-part of Ser. No. 808,166, Jun. 20, 1977, abandoned. This application Aug. 23, 1979, Ser. No. 69,111

The portion of the term of this patent subsequent to Jul. 3, 1996, has been disclaimed.

Int. Cl.[3] G01N *21/24, 1/14*

U.S. Cl. 422—64 **5 Claims**



1. Apparatus for monitoring chemical reactions occurring in a plurality of liquid or the like sample substances carried in a plurality of respective cuvettes whose walls are at least to some extent capable of transmitting radiant energy which comprises,

A. a support structure,

B. a horizontally disposed cuvette carrier having a plurality of cuvettes disposed thereon in a circular array around the periphery of the carrier and the array having a central vertical axis, the cuvette carrier being nonrotatably mounted on the support structure,

C. a rotor horizontally disposed parallel with the cuvette carrier and mounted for rotation on the said axis,

D. a plurality of photometers arranged on said rotor and each including a photoresponsive element and there being radiant energy source means serving all of the photoresponsive elements and directing a direct rectilinear beam of radiant energy to each of them whereby there is at least one beam for each element, the source means and elements being geometrically arranged in a radial configuration around the rotor, and the beams being so located that each will cut through all of the cuvettes in sequence during rotation of the rotor,

E. means for driving the rotor in a rotary movement,

F. the photoresponsive elements being responsive to the beams to produce electrical signals when intercepted by cuvettes, the signals being related to the chemical conditions of sample substance, if any, carried by the respective cuvettes,

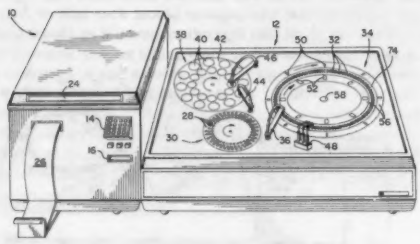
G. means for generating usable data from any such signals associated with said support structure and non-rotatable, and

H. means for coupling the signals from the rotor to said last mentioned means.

4,234,540
APPARATUS FOR MONITORING CHEMICAL REACTIONS AND EMPLOYING MOVING PHOTOMETER MEANS

Guenter Ginsberg, Miami, Fla.; Thomas Horne, Harpenden, England, and Robert L. Kreiselman, Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of Ser. No. 846,337, Oct. 28, 1977, which is a continuation-in-part of Ser. No. 808,166, Jun. 20, 1977, abandoned. This application Aug. 24, 1979, Ser. No. 69,256
The portion of the term of this patent subsequent to Jul. 3, 1996, has been disclaimed.
Int. Cl.[3] G01N *21/24, 1/14*
U.S. Cl. 422—64 13 Claims



1. Apparatus for monitoring chemical reactions occurring in a plurality of liquid or the like sample substances carried in a plurality of respective cuvettes whose walls are at least to some extent capable of transmitting radiant energy which comprises:

A. support means,

B. a rotor and a turntable mounted coaxially on the support means and capable of rotation relative to the support means and relative to one another, one of said rotor and turntable being journalled on the other, said other being journalled on said support means,

C. a plurality of radiant-energy-transmissive cuvettes mounted to the turntable and disposed in a circular arrangement about said axis and adapted to have sample substances producing chemical reactions carried in at least some of said cuvettes,

D. first drive means for rotating the turntable on its axis in a first program of rotation whereby the cuvettes describe an annular path as the turntable rotates,

E. second drive means for rotating the rotor on said axis in a second program of rotation in which the number of total revolutions of the rotor for a given period of time is greater than the number of revolutions of the turntable for the same period of time,

F. photometer means mounted on the rotor and defining at least one beam path for radiant energy which extends at least through said annular path such that the beam path includes and traverses at least a portion of the sample substance which may be contained in any of said cuvettes which intersects such beam path during rotation of the turntable or rotor,

G. the photometer means including means responsive to any radiant energy projected along said beam path to produce electrical signals as the cuvettes intersect the beam path, which signals are related to chemical conditions of the sample substances, if any, which amy be contained in said cuvettes,

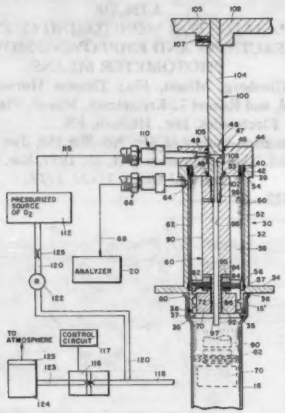
H. means for generating usable data from any such signals and

I. means for coupling at most all of the electrical signals from said photometer means to said data generating means.

4,234,541
COMBUSTION CHAMBER CLEANING APPARATUS

Roger L. Bredeweg, and George J. Sitek, both of Stevensville, Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Mar. 2, 1979, Ser. No. 16,975
Int. Cl.[3] G01N *31/12;* B01D *41/04;* B08B *1/04;* F23J *3/00*
U.S. Cl. 422—78 14 Claims



1. For use with a combustion chamber for combusting solid or liquid specimens for subsequent analysis of gases therefrom, a cleaning system for cleaning the combustion chamber comprising:

a cylindrical housing for rotatably and slideably supporting a cleaning brush;

a cleaning brush rotatably and slideably supported by said housing and including shaft means for moving said brush between a retracted position within said housing and from an end of said housing to operative cleaning positions extended from said housing, a plug mounted to said shaft adjacent said brush on a side of said brush adjacent said end of said housing when said brush is retracted within said housing; and

said end of said housing including internal thread means extending inwardly and aligned with and radially spaced from said plug when said brush is in a retracted position within said housing to form a spiral pathway for gas exiting from a combustion chamber.

4,234,542
THIN COAT TEMPERATURE COMPENSATED RESISTANCE OXIDE GAS SENSOR

Donald J. Romine, Fostoria, Ohio, assignor to Bendix Autolite Corporation, Fostoria, Ohio

Filed Jan. 29, 1979, Ser. No. 7,134
Int. Cl.[3] G01N *27/12*
U.S. Cl. 422—98 5 Claims

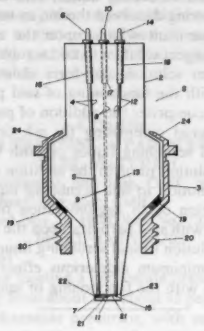
1. A temperature compensated electrochemical oxygen sensing element for determining the oxygen content in an exhaust gas of an internal combustion engine, comprising:

(a) an insulating ceramic support having first, second and third electrodes disposed, in spaced relation to each other, on the surface of the ceramic support that is to be exposed to the exhaust gas;

(b) a layer of a first resistance material, the resistance of which varies as a function only of temperature, said layer covering the first electrode and a portion of the second electrode; and

(c) a layer of a second resistance material, the resistance of which varies as a function of temperature and the partial

pressure of oxygen in the gas to which it is exposed, said layer covering the third electrode, the remaining portion



of the second electrode and said layer of first resistance material.

4,234,543

FLUID-WALL REACTOR FOR HIGH TEMPERATURE CHEMICAL REACTION PROCESSES

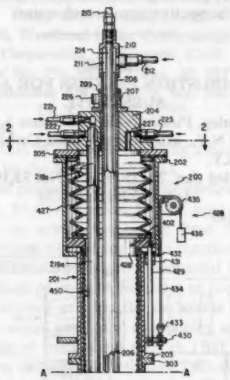
Edwin Matovich, Brea, Calif., assignor to Thagard Technology Company, Irvine, Calif.

Continuation of Ser. No. 792,858, May 2, 1977, which is a continuation of Ser. No. 606,222, Aug. 20, 1975, abandoned, and a continuation-in-part of Ser. No. 271,560, Jul. 13, 1972, Pat. No. 3,933,434. This application Oct. 30, 1978, Ser. No. 955,530

The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.

Int. Cl.[3] B01J *3/00, 19/08*

U.S. Cl. 422—109 **6 Claims**



1. In combination with a high temperature chemical reactor wherein substantially all of the heat is supplied by radiation coupling including:

(a) a reactor tube having an inlet end and an outlet end, the interior of the tube defining a reactor chamber, the outlet end being in communication with a reactor outlet,

(b) means for generating an annular envelope of an inert fluit which is substantially transparent to radiation radially inwardly of the inner surface of the reactor tube to constitute a protective blanket for the inner surface,

(c) means for introducing at least one reactant into the reactor chamber through the inlet end of the reactor tube in a predetermined path axially of the reactor tube, the reactants being confined by the protective blanket substantially centrally within the reactor chamber and out of contact with the inner wall of the reactor tube, and

(d) electrical means for directing high intensity radiant energy into the reactor chamber to coincide with at least a portion of the predetermined path of the reactants;

a variable profile, counterflow heat exchanger being secured at an inlet end to the outlet of the reactor for receiving high temperature reaction products, the heat exchanger comprising an inner tubular wall of refractory material, the interior of the inner tubular wall defining a passageway which extends from an inlet opening to an outlet opening of the heat exchanger, an outer tubular wall of refractory material spaced concentrically outwardly from the inner wall, and a spiral baffle of refractory material disposed between the inner and outer walls to define a spiral, annular coolant channel; and, at least one coolant inlet extending through the outer wall in communication with the coolant channel, the coolant being discharged at an outlet of the spiral, annular channel adjacent the inlet end of the heat exchanger.

4,234,544

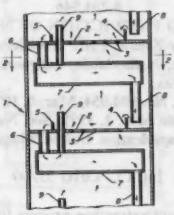
LIQUID-LIQUID EXTRACTION APPARATUS

William J. Christman, Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 934,243, Aug. 16, 1978. This application Jun. 25, 1979, Ser. No. 51,776

Int. Cl.[3] B01D *11/04, 12/00;* **C10G** *21/00*

U.S. Cl. 422—256 **6 Claims**



1. A liquid-liquid extraction apparatus which comprises:

(a) a cylindrical outer vessel having a vertical major axis, a cylindrical internal volume and a first and a second lateral half;

(b) a plurality of horizontal perforated liquid support trays extending across the internal volume of the outer vessel at vertically spaced intervals, including an upper first tray and a vertically contiguous lower second tray;

(c) a plurality of liquid downcomers operably connected to the liquid support trays, including a first downcomer attached to said first tray which comprises:

i. a first vertical conduit having a first cross-sectional area and connected to an opening through said first tray located in the first lateral half of said outer vessel, said first vertical conduit extending downward and terminating at a lower end located below said first tray;

ii. a liquid separation chamber having a first and a second end, an internal volume, a substantially horizontal major axis and a cross-sectional area at least twice as large as said first cross-sectional area, with said lower end of said first vertical conduit being connected to said liquid separation chamber, and with the first end of said liquid separation chamber being located in said first lateral half of said outer vessel and said second end of said liquid separation chamber being located in said second lateral half of said outer vessel;

iii. a second vertical conduit having an upper end connected to said liquid separation chamber and an open lower end located at a point in the second lateral half of said outer vessel and above said second tray, said sec-

ond vertical conduit having a smaller cross-sectional area than said liquid separation chamber; and,

(d) a third vertical conduit having a lower open end in communication with the internal volume of the liquid separation chamber, the third vertical conduit extending upward from the liquid separation chamber and through said first tray and having an upper open end located at a point above said first tray.

4,234,545

PROCESS FOR THE RECOVERY OF COBALT VALUES

Moustafa El-Chahawi, Troisdorf, and Uwe Prange, Niederkassel-Ranzel, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 2, 1978, Ser. No. 947,904

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745377

Int. Cl.³ C01G *51/02, 51/04*

U.S. Cl. 423—138 **8 Claims**

1. A process of recovering cobalt values from a cobalt-containing residue containing from 0.01 to 10% by weight cobalt obtained from a carbonylation process catalyzed by a cobalt-containing catalyst which consists essentially of heating said cobalt-containing residue in a combustion chamber at a temperature of 800° to 1200° C. for two to five seconds in the presence of an amount of oxygen or oxygen-containing gas to convert the cobalt contained therein to cobalt oxide.

4,234,546

LIQUID/LIQUID EXTRACTION OF NICKEL VALUES

Abraham J. van der Zeeuw; Peter Koenders, and Riekert Kok, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

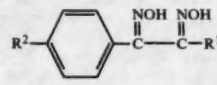
Continuation of Ser. No. 884,054, Mar. 6, 1978, abandoned. This application Mar. 1, 1979, Ser. No. 16,679

Claims priority, application United Kingdom, Mar. 7, 1977, 9468/77

Int. Cl.³ C01G *53/00*

U.S. Cl. 423—139 **11 Claims**

1. The liquid/liquid extraction process for the separation of nickel values from an aqueous solution containing nickel values and having a pH between 1.6 and 3.0 which comprises contacting the aqueous solution with an organic extractant comprising a substantially water-immiscible organic solvent and one or more alpha, beta-dioxime compounds of the general formula I



(I)

where R^2 represents an alkyl group of from 7 to 20 carbon atoms, and R^1 represents an alkyl group having less than ten carbon atoms or a hydrogen atom, thereby forming an organic extract phase containing nickel values in solution and an aqueous raffinate phase.

4,234,547

FLUE GAS TREATMENT

Peter Urban, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed May 7, 1979, Ser. No. 36,932

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 **5 Claims**

1. In a process for the absorptive removal of sulfur dioxide from a gaseous mixture by contacting said gaseous mixture in a scrubbing zone with a scrubbing liquor comprising a buffered solution of an alkali metal sulfite and bisulfite, the alkalinity of said scrubbing liquor being maintained by the addition thereto of an aqueous alkaline reagent solution comprising sodium carbonate or sodium bicarbonate having a relatively high ph with respect to said scrubbing liquor, said aqueous alkaline reagent solution having dissolved therein an undesirable quantity of silica contaminant which, upon the addition of said aqueous alkaline reagent solution to said scrubbing liquor tends to precipitate from solution and form deleterious deposits which interfere with the functioning of said process, the improvement which comprises the addition of particles of finely divided solid material comprising fly ash or solid material obtained from said scrubbing liquor or both to said aqueous alkaline reagent solution prior to the addition of said aqueous alkaline reagent solution to said scrubbing liquor thereby effecting the formation of an agglomeration of precipitate of silica contaminant with said particles upon the addition of said alkaline reagent solution to said scrubbing liquor, said agglomeration having a minimum deleterious effect and relatively minor interference with the functioning of said process.

4,234,548

CONTROL OF NITROGEN OXIDES FROM STATIONARY SOURCE EFFLUENTS

Laurence K. Burnell; James D. Hyde, both of Troy; Nicholas P. Kolak, Latham, and Richard E. Gibbs, Troy, all of N.Y., assignors to Nox Research Corp., New York, N.Y.

Division of Ser. No. 792,473, Apr. 29, 1977. This application Jul. 12, 1978, Ser. No. 923,902

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—235 **9 Claims**

1. In a process of removing nitrogen oxides from flue gases containing nitrogen oxides, the improvement which comprises contacting the flue gases with a scrubbing solution consisting essentially of: from about 0.01 molar to about 2 molar of an inorganic basic compound; from about 0.05 molar to about 2 molar of a sulfite anion source; from about 5×10^{-4}% to about 5% by weight of the solution of a surface-active agent selected from the group consisting of anionic, cationic, nonionic, and ampholytic surface-active agents; and water.

4,234,549

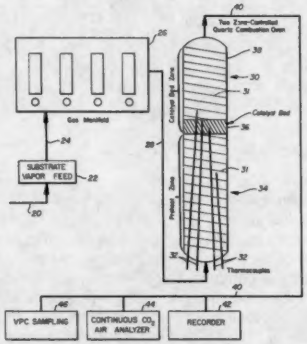
NOVEL COMBUSTION PROCESS FOR AN ORGANIC SUBSTRATE

Priscilla B. Stanley, Pleasantville, and James S. Ritscher, Ossining, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,194

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—245 **19 Claims**



1. A process for the combustion of an organic substrate wherein said process comprises intimately contacting said organic substrate, at a temperature below the temperature of ignition of the organic substrate, with an organophilic catalyst

bed comprised of a metal-containing zeolite having a silica to alumina ratio of at least 10, wherein the metal is at least one of platinum, palladium, copper, nickel, chromium and manganese; and combusting the organic substrate by an adiabatic temperature rise in the catalyst bed, in the presence of an oxygen-containing gas, after sufficient organic substrate has been adsorbed by the catalyst bed.

4,234,550

METHOD FOR TREATING A PARTICULATE NUCLEAR FUEL MATERIAL

William R. DeHollander, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Nov. 8, 1976, Ser. No. 739,716

Int. Cl.[2] C01G *43/02*

U.S. Cl. 423—261 **14 Claims**

1. A method of treating a particulate uranium oxide composition containing from about 3 to about 15 percent by weight of an ammonium diuranate precursor, with or without fluoride impurities, comprising the steps of

(a) contacting said composition with a sufficient amount of an ammonium hydroxide solution to convert said precursor to ammonium diuranate, convert any fluoride compounds to ammonium fluoride, and form a treated composition containing solid agglomerates, and

(b) heating the treated composition under a controlled atmosphere at a temperature of from about 300° C. to about 700° C., said temperature being sufficient to dry the agglomerates, sublime any ammonium fluoride, and convert the ammonium diuranate to uranium dioxide yielding a particulate composition comprised substantially of uranium dioxide, said composition being capable of compaction into unsintered structures of increased strength.

4,234,551

EUROPIUM CARBOXIDE AND METHOD OF PREPARING THE SAME

Alfred J. Darnell, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 812,022, Jun. 30, 1977, abandoned. This application Apr. 23, 1979, Ser. No. 32,058

Int. Cl.[3] C01F *17/00*

U.S. Cl. 423—263 **13 Claims**

1. A composition of matter comprising a europium carboxide represented by the formula, Eu_2CO.

2. A method of preparing a lanthanide carboxide having the general formula, M_2CO, wherein M is at least one lanthanide element having an atomic number of from 57 through 71, inclusive, comprising introducing into a reaction zone a particulate mass of at least one selected elemental lanthanide and carbon monoxide in an amount sufficient to provide about the stoichiometric amount to form the carboxide and in the absence of other reactive gases, and maintaining a temperature in the reaction zone of from about 400° to 1500° C., for a time sufficient to form the desired lanthanide carboxide and recovering the lanthanide carboxide.

4,234,552

STABILIZATION OF SULPHUR

Grahame L. Stanley, Ockbrook, England, assignor to Courtaulds Limited, London, England

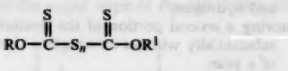
Filed Sep. 28, 1979, Ser. No. 79,940

Claims priority, application United Kingdom, Oct. 18, 1978, 41114/78

Int. Cl.[3] C01B *17/12*

U.S. Cl. 423—268 **7 Claims**

1. Sulphur, of which at least 30 percent by weight is insoluble in carbon disulphide at 20° C., characterised in that the sulphur has incorporated therewith as stabiliser a dixanthogen of the formula



where R and R^1 are each independently an alkyl, cycloalkyl, aralkyl or aryl group and may be substituted by halogen or alkoxy and n is 2 or 4.

4,234,553

PROCESS AND APPARATUS FOR THE PREPARATION OF AMMONIA AND HEAVY WATER

Charles Mandrin, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

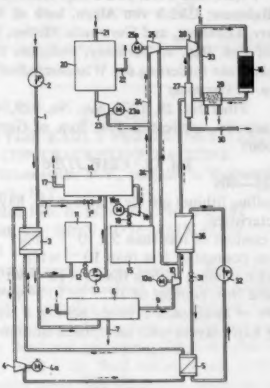
Filed May 12, 1977, Ser. No. 796,308

Claims priority, application Switzerland, May 13, 1976, 6019/76

The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.

Int. Cl.[3] C01C *1/04*

U.S. Cl. 423—359 **6 Claims**



1. An apparatus for the production of ammonia and heavy water comprising

a nitrogen-producing means for generating a flow of nitrogen;

a monothermal isotope exchanger for enriching water of a natural deuterium concentration with deuterium;

a heavy water preparation plant connected to said exchanger for receiving a portion of the deuterium-enriched water and preparing heavy water therefrom;

an electrolyzer for electrolytically dissociating water to produce hydrogen;

an enriched-water storage tank connected to said exchanger for receiving and storing a second portion of the deuterium-enriched water, said tank being selectively connected to said electrolyzer to deliver stored deuterium-enriched water to said electrolyzer;

a hydrogen storage tank selectively connected to said electrolyzer to receive hydrogen produced in said electrolyzer; and

an ammonia synthesizing plant connected to said nitrogen producing means and connected to said heavy water preparation plant and said hydrogen storage tank for receiving a synthesis gas mixture of nitrogen from said nitrogen producing means and hydrogen from said heavy water preparation plant and said hydrogen storage tank.

5. A process for the production of ammonia and heavy water, said process comprising the steps of

enriching a flow of water with deuterium in a monothermal isotopic process;

supplying a first portion of the deuterium-enriched water to

a heavy water preparation plant to produce heavy water and hydrogen;

storing a second portion of the deuterium-enriched water substantially without interruption during the colder half of a year;

electrolytically dissociating the stored deuterium-enriched water substantially without interruption during the warmer half of a year to form hydrogen;

storing a portion of the electrolytically-produced hydrogen during said warmer half of a year;

generating a flow of nitrogen; and

supplying the flow of nitrogen, the hydrogen from the heavy water preparation plant and the stored hydrogen to a synthesizing plant during said colder half of a year while supplying the flow of nitrogen, the hydrogen from the heavy water preparation plant and the remainder of the electrolytically-produced hydrogen to the synthesizing plant during said warmer half of a year.

4,234,554

STABLE CRYSTALLINE LITHIUM NITRIDE AND PROCESS FOR ITS PREPARATION

Albrecht Rabenau; Ulrich von Alpen, both of Stuttgart; Erich Schönherr, Leonberg, and Gertraude Müller, Leonberg-Ramtel, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur forderung der Wissenschaften e.V., Göttigen, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 929,143

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750607

Int. Cl.³ C01B *21/06*

U.S. Cl. 423—409 **5 Claims**

1. Crystalline lithium nitride, stable in air, having the following characteristics:

sodium content of less than 5×10^{-2} wt%

potassium content of less than 10^{-2} wt%

magnesium content of less than 1×10^{-2} wt%

silicon and iron content of 10^{-2} to 10^{-3} wt%

in the form of hexagonal crystals having a layered structure containing Li_2N layers with interposed lithium ions.

4,234,555

REMOVAL OF URANIUM FROM AQUEOUS HF SOLUTIONS

Howard Pulley, West Paducah, and Steven F. Seltzer, Paducah, both of Ky., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 29, 1978, Ser. No. 920,525

Int. Cl.³ G21F *9/12*; C02F *1/62*

U.S. Cl. 423—484 **10 Claims**

1. The method of decreasing the uranium content of an aqueous HF solution containing uranium to provide a product aqueous HF solution of increased purity, said method comprising:

mixing particulate calcium fluoride with said solution to form uranium-bearing particulates,

permitting said particulates to sediment from said solution, and

separating the resulting aqueous HF solution from the settled particulates.

4,234,556

METHOD OF PRODUCING CALCIUM BROMIDE

Clara J. del Valle, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 817,938, Jul. 22, 1977, abandoned. This application Oct. 5, 1979, Ser. No. 83,051

Int. Cl.³ C01F *11/34*

U.S. Cl. 423—497 **10 Claims**

1. In the method of producing calcium bromide wherein hydrogen bromide is reacted with calcium hydroxide in the presence of water and carbonates, the improvement comprising acidifying the reaction mixture to a pH of from about 1 to about 3, and maintaining such pH range for a sufficient time to convert at least a portion of the carbonates to carbon dioxide, thereby removing carbonates from the reaction mixture.

4,234,557

MOLTEN SALT SYNTHESIS OF ALKALI NIOBATE POWDERS

Ronald H. Arendt, and Joseph H. Rosolowski, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,911

Int. Cl.³ C01G *33/00*

U.S. Cl. 423—593 **6 Claims**

1. A process for producing alkali niobate powder which consists essentially of providing particulate niobium pentoxide in stoichiometric amount or particulate precursor therefor, providing particulate alkali oxide in stoichiometric amount or particulate precursor therefor, said alkali oxide being selected from the group consisting of sodium oxide, potassium oxide, lithium oxide and mixtures thereof, providing an alkali chloride salt selected from the group consisting of sodium chloride, potassium chloride and mixtures thereof, forming a mixture of said niobium pentoxide or precursor therefor, said alkali oxide or precursor therefor and said chloride salt solvent, said chloride salt being used in an amount of at least about 20% by weight of the total amount of said niobium pentoxide, alkali oxide and said chloride salt, heating said mixture to a reaction temperature at least sufficient to melt said chloride salt, each said precursor decomposing completely at or below said reaction temperature to form said oxide and by-product gas, said chloride salt in molten form being a solvent for said niobium pentoxide and alkali oxide, maintaining said reaction temperature dissolving and reacting said niobium pentoxide and alkali oxide in said molten salt and precipitating said alkali niobate, and recovering said precipitated alkali niobate by dissolving said chloride salt and separating said precipitated alkali niobate from the resulting salt solution.

4,234,558

MOLTEN SALT SYNTHESIS OF ORTHORHOMBIC LEAD METANIOBATE POWDER

Ronald H. Arendt, and Joseph H. Rosolowski, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,921

Int. Cl.³ C01G *33/00*

U.S. Cl. 423—593 **4 Claims**

1. A process for producing a reaction product powder containing orthorhombic lead metaniobate in excess of 50% by volume of said reaction product, which consists essentially of providing particulate PbO in stoichiometric amount or particulate precursor therefor, providing particulate Nb_2O_5 in stoichiometric amount or particulate precursor therefor, providing an alkali chloride salt selected from the group consisting of sodium chloride, potassium chloride and mixtures thereof, forming a mixture of said PbO or precursor therefor, said Nb_2O_5 or precursor therefor and said chloride salt solvent, said chloride salt being used in an amount of at least about 20% by weight of the total amount of said PbO and Nb_2O_5 and said chloride salt, heating said mixture to a reaction temperature at least sufficient to melt said chloride salt, each said precursor decomposing completely at or below said reaction temperature to form said oxide and byproduct gas, said chloride salt in molten form being a solvent for said PbO and Nb_2O_5, maintaining said reaction temperature dissolving and reacting said PbO and Nb_2O_5 in said molten salt and precipitating said reaction product powder, and recovering said precipitated reaction product powder by dissolving said chloride salt and separating said precipitated reaction product powder from the resulting salt solution.

4,234,559

PROCESS FOR THE MANUFACTURE OF COARSE ALUMINUM HYDROXIDE

Otto Tschamper, Volketswil, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 24, 1979, Ser. No. 87,663

Claims priority, application Switzerland, Nov. 7, 1978, 11428/78

Int. Cl.[3] C01F 7/14

U.S. Cl. 423—629 10 Claims

1. A process for the manufacture of coarse aluminum hydroxide having a maximum of 15 weight percent of particles with a diameter less than 45 micrometers by a two stage decomposition of a supersaturated alkaline aluminate solution, by the addition of aluminum hydroxide seed material of different quality to said aluminate solution in each of said two stages, which comprises

(a) distributing the quantity of aluminum hydroxide seed material as follows: adding to said aluminate solution a first addition of fine seed material (primary seed material) in a first stage of the decomposition, where the quantity thereof is so calculated that the ratio between the supersaturation in grams of Al_2O_3 per liter of aluminate liquor and the surface area of said seed material expressed in square meters per liter of aluminate liquor lies between 7 and 25 grams per square meter; and

adding to said aluminate solution a second addition of coarse seed material (secondary seed material) in a second stage of the decomposition after an interval of approximately two hours after the first addition such that the total amount of seed material (primary and secondary seed material) is at least 130 grams $Al(OH)_3$ per liter of aluminate liquor; and

(b) regulating the temperature of the decomposition in the following manner:

conducting said first stage of the decomposition in a temperature range of 77 degrees Celsius to 66 degrees Celsius; and

conducting said second stage of the decomposition at a reduced temperature which can be down to approximately 40 degrees Celsius.

4,234,560

PROCESS FOR TREATING A LIQUID WITH A GAS AND FOR PREVENTING THE PHASE SEPARATION OF UNREACTED GAS AND LIQUID, IN A CIRCULATORY REACTOR

Heribert Kuerten; Otto Nagel, both of Neustadt, and Peter Zehner, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

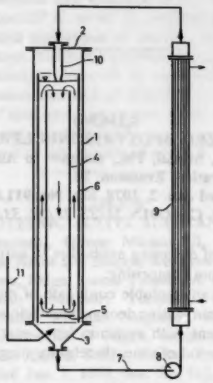
Filed Sep. 30, 1977, Ser. No. 838,356

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645780

Int. Cl.[3] B01D 47/02; C01D 15/06

U.S. Cl. 423—659 10 Claims

1. A process for treating a liquid and a gas and substantially preventing phase separation of unreacted gas and liquid in a circulatory reactor containing a liquid-immersed circulation tube, the ratio of reactor height:reactor diameter being 2:1 to 30:1 and the ratio of diameter of the circulation tube:diameter of the reactor being from 0.1:1 to 0.7:1, wherein: the gas is introduced into and finely dispersed in the liquid by one or more jets of liquid which issue from one or more nozzles arranged above the circulation tube with the nozzle orifice positioned at about the level of the circulating liquid; said gas is entrained downwards in the circulation tube by the circulating gas-liquid stream, which exits from the bottom end of said tube and rises in the annular space immediately surrounding the tube, the velocity of the liquid in the circulation tube being from 1 to 6 times as great as the velocity in the annular space; and any gas remaining in the liquid after the liquid rises in the annular space very largely remains entrained in the liquid, which is drawn over the upper edge of the circulation tube



from the annular space and thence downward again into the circulation tube.

4,234,561

ANTIGEN FOR EARLY PREGNANCY TEST AND CONTRACEPTIVE VACCINE

Om P. Bahl, Williamsville, N.Y., assignor to Research Corporation, New York, N.Y.

Filed Feb. 6, 1978, Ser. No. 875,497

Int. Cl.[2] G01N 33/16; A61K 43/00

U.S. Cl. 424—1 8 Claims

1. A radioimmunoassay procedure for detecting the presence of hCG in body fluids which comprises contacting said body fluids with a complex comprising radioactively tagged hCG and an antibody; subsequently separating the complex from said body fluid and measuring the radioactive of either said complex or said body fluid wherein said antibody comprises an antiserum generally selective in reactivity to hCG to a distinguishing degree from the luteinizing hormone, which is produced by the process which comprises:

isolating the β-subunit of human chorionic gonadotropin, reducing and cleaving six of the intrachain disulfide bonds of said β-subunit;

alkylating the thus reduced intrachain disulfide bonds and conjugating said β-subunit with a protein or hapten;

isolating said antigen;

administering said antigen to a host animal whereby said animal generates an antibody response to said antigen;

and extracting said antiserum from said animal.

4,234,562

RADIOGRAPHIC SCANNING

Andrew J. Tofe, and Marion D. Francis, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 701,478, Jun. 30, 1976, abandoned, which is a continuation of Ser. No. 462,477, Apr. 19, 1974, Pat. No. 3,983,227, which is a continuation-in-part of Ser. No. 363,286, May 23, 1973, abandoned. This application Mar. 20, 1978, Ser. No. 888,599

Int. Cl.[2] A61K 29/00

U.S. Cl. 424—1 11 Claims

1. A composition for the preparation of an improved bone scanning agent comprising a dry mixture of:

(a) methanehydroxydiphosphonic acid and pharmaceutically-acceptable salts, and mixtures of salts, thereof; and

(b) an amount of an anhydrous hydrochloric or sulfuric acid salt of a metal selected from the group consisting of fer-

rous, chromous and stannous and mixtures thereof sufficient to produce a molar ratio of metal to phosphonate of from about 1:15 to about 1:80.

4,234,563

INSOLUBILIZED DEOXYRIBONUCLEIC ACID (DNA)

Delfin F. Rippe, Miami, Fla., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 2, 1978, Ser. No. 911,865
Int. Cl.[2] G01N *31/22, 21/52, 33/16*
U.S. Cl. 424—8 **12 Claims**

1. A method of detecting antibodies to native deoxyribonucleic acid in serum comprising:

A. incubating an insoluble conjugate of methylated bovine serum albumin -native deoxyribonucleic acid with a serum from a patient with systemic lupus erythematosus for a sufficient period of time, thereby forming a serum flocculate;

B. washing said serum flocculate mixture and separating therefrom the supernatant fluid;

C. adding a fluorescein labeled anti-immunoglobulin antibody to the washed flocculate and incubating the labeled mixture for a sufficient period of time;

D. washing said incubated flocculate and separating therefrom the supernatant fluid; and

E. suspending the incubated flocculate in a washing medium and determining the fluorescence thereof, which is proportional to the concentration of antibodies to said native deoxyribonucleic acid.

7. A method for detecting antibodies to calf thymus nuclear extracts in serum comprising:

A. incubating an insoluble conjugate of methylated bovine serum albumin and calf thymus nuclear extracts with a serum from a patient for a sufficient period of time, thereby forming a serum flocculate:

B. washing said serum flocculate mixture and separating therefrom the supernatant fluid;

C. adding a fluorescein-labeled anti-immunoglobulin antibody to the washed flocculate and incubating the labeled mixture for a sufficient period of time;

D. washing said incubated flocculate and separating therefrom the supernatant fluid; and

E. suspending the flocculate in a washing medium and determining the fluorescence thereof, which is proportional to the concentration of antibodies to said calf thymus nuclear extract.

4,234,564

HEPATITIS B CORE ANTIGEN COMPOSITION

William J. McAleer, Ambler; William J. Miller, North Wales, and Edward H. Wasmuth, Telford, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 789,033, Apr. 20, 1977, Pat. No. 4,102,996. This application Dec. 19, 1977, Ser. No. 861,809
Int. Cl.[3] A61K *39/29*; C12N *7/00*; G01N *33/54*
U.S. Cl. 424—12 **1 Claim**

1. A composition for use in a diagnostic assay or in the preparation of a therapeutic composition comprising hepatitis B core antigen in a carrier comprising bovine serum albumin containing Tris, $MgCl_2$ and NaCl having a pH of 7.6, the ingredients in said carrier being in proportions suitable for storing the composition in a liquid nitrogen freezer.

4,234,565

POLYMER

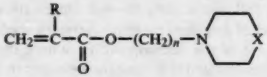
Per G. M. Flodin, Täby; Peter G. Komlos, Märsta, and Bengt G. Ranby, Djursholm, all of Sweden, assignors to Astra Chemical Products AB, Sodertalje, Sweden

Division of Ser. No. 892,869, Apr. 3, 1978. This application Mar. 2, 1979, Ser. No. 16,815
Claims priority, application Sweden, Apr. 4, 1977, 7703901
Int. Cl.[3] A61K *9/32*
U.S. Cl. 424—33 **15 Claims**

1. Product in the form of particles, which particles have been coated with a layer of polymer having pH dependent solubility characteristics in aqueous media, formed by the polymerization of

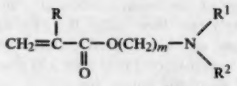
(a) methylmethacrylate,

(b) at least one monomer selected from the group consisting of a monomer of the general formula



I

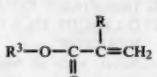
wherein R is selected from the group consisting of hydrogen and methyl, X is selected from the group consisting of $—CH_2$, and —O, and n is an integer of from 1–4, and a monomer of the general formula



II

wherein R is selected from the group consisting of hydrogen and methyl, R^1 and R^2 are each selected from the group consisting of hydrogen, methyl, ethyl, propyl, isopropyl, isobutyl, t-butyl, and n-butyl, whereby R^1 and R^2 are not both hydrogen, and m is an integer of from 1–4; and wherein the monomer according to formula I, when present, is 30–50 mol-% of the amount of monomers charged; and wherein the monomer of formula II, when present, is 20–30 mol-% of the amount of monomers charged; and

(c) at least one monomer of the general formula



III

wherein R^3 is a straight or branched alkyl group having 4–18C, and R^4 is hydrogen or methyl, and wherein the monomer according to formula III is 0.5–6.0 mol-% of the amount of monomers charged; and

wherein the polymer has pH dependent solubility such that the compound is essentially water insoluble above pH=5, but essentially water permeable at pH=3; and

wherein the nitrogen content of the polymer is 2.5–3.3%.

4,234,566

ANTIHISTAMINE AND METHODS FOR USE THEREOF

Elias W. Packman, 214 Sycamore Ave., Merion, Pa. 19066, and Ruth Jeffkin, 259 Richards Ave., Lansdowne, Pa. 19050

Division of Ser. No. 741,298, Nov. 12, 1976. This application Jun. 29, 1979, Ser. No. 53,399
Int. Cl.[3] A61K *7/00, 7/32, 7/34, 7/36*
U.S. Cl. 424—47 **21 Claims**

6. The method of controlling perspiration which comprises administering topically to a human, a synergistic antiperspirant composition comprising an antihistamine selected from the group consisting of an ethanolamine, an ethylenediamine, an

alkylamine, a phenothiazine and a piperazine, or a physiologically acceptable salt thereof, in conjunction with a metal salt having astringent properties, and a pharmaceutically acceptable carrier, the combined amounts of the antihistamine and the metal salt act together to produce a synergistic effect and being in an amount effective to control the perspiration.

4,234,567

WASP AND HORNET SPRAY COMPOSITION

Lloyd T. Flanner, 4175 Americana Dr., Apt. A-12, Stow, Ohio 44224

Filed Jan. 8, 1979, Ser. No. 1,706
Int. Cl.[3] A61L *9/04*; A01N *37/00, 37/08, 43/02*
U.S. Cl. 424—45 **3 Claims**

1. A wasp and hornet spray composition formed from about 50% of a mixture of pyrethrins, piperonyl butoxide, carbaryl, petroleum distillates and inert ingredients and about 50% of a propellant solvent composition consisting of 1,1,1 trichloroethane and carbon dioxide; there being a synergistic action obtained between the 1,1,1 trichloroethane and the active ingredients of pyrethrins, piperonyl butoxide, carbaryl and petroleum distillate which are present in about 0.075; 0.188; 0.500 and 24.222 parts by weight, respectively, and where about 25 parts by weight of inert ingredients are present in the complete spray composition, and where about 7.5 parts of carbon dioxide are dissolved in about 92.5 parts of the 1,1,1 trichloroethane to form the spray-solvent mixture.

4,234,568

METHOD AND COMPOSITION FOR INHIBITING PLAQUE

Frances C. Benkwitt, Yonkers, and Fawzy G. Sherif, Stony Point, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 30, 1979, Ser. No. 25,440
Int. Cl.[3] A61K *7/22*
U.S. Cl. 424—54 **6 Claims**

1. An oral composition for inhibiting plaque formation on teeth which contains an effective amount of from about 0.05% to about 5.0% of a compound formed by reacting a long chain aliphatic alkylene primary amine having from about 16–18 carbon atoms and trimetaphosphoric acid having a molar ratio of from about 2.9–3.1 of the amine to about 0.9–1.1 of the acid wherein the effective amount of the compound is based on the weight of the composition.

4,234,569

PRODUCTION OF ALDEHYDE-TREATED ALLERGEN-CONTAINING SUBSTANCES

David G. Marsh, Overlea, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 550,535, Feb. 18, 1975, which is a continuation-in-part of Ser. No. 289,284, Sep. 15, 1972, abandoned, which is a continuation of Ser. No. 865,481, Oct. 10, 1969, abandoned. This application Oct. 4, 1978, Ser. No. 948,409
Int. Cl.[3] A61K *39/35, 39/36*; C07G *7/00*
U.S. Cl. 424—91 **48 Claims**

1. A process for producing an aldehyde-treated allergen of low allergenic reactivity in allergic humans and which retains the desired immunizing properties of the native allergen leading to amelioration of the symptomatology of allergic individuals and concomitant production of blocking antibody considered to be associated with, but not necessarily uniquely responsible for, such relief of symptoms, and which is capable of inducing in mammals the formation of blocking antibodies against the native allergen in significant concentration which comprises allowing allergens from which essentially all low molecular weight, non-allergenic substances have been removed to react chemically under mild conditions with an aldehyde solution selected from the group consisting of formaldehyde, lower saturated aliphatic di-functional aldehydes and combinations thereof, in at least two steps with the provisos that any formaldehyde reactions are carried out in a non-phenolic environment and wherein said mild conditions comprise a reaction step which is carried out at a temperature of from just above the freezing point of the solution to 15° C., and at least one subsequent step which is carried out at a temperature of from about 25° C. to 40° C., with any combination of formaldehyde, said dialdehyde or mixture thereof in each of the successive steps, to form a product having intra- or intermolecular crosslinking induced by said aldehydes and the allergenic determinant groups are modified to result in substantial reduction of allergenic properties while largely retaining the desired immunizing properties.

20. The product of the process of claim 1.

4,234,570

PROTEINIC ACTIVE SUBSTANCES

Yoshinori Kanbayashi, Ohtsu; Michio Ui, Sapporo; Koichi Hosoda, Shiga; Akira Ito; Shigeki Kurokawa, both of Ohtsu; Akio Terashima, Shiga; Isamu Takahashi, Ohtsu; Motoyuki Yajima, Ohtsu; Chikanori Tomioka, Ohtsu; Tsutomu Nakamura, Ohtsu; Katsumi Nogimori, Kyoto, and Taira Okamoto, Kusatsu, all of Japan, assignors to Kakenyaku Kako Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1978, Ser. No. 911,665
Claims priority, application Japan, Jun. 10, 1977, 52-69154
Int. Cl.[3] A61K *37/00*; C07C *103/52*; C12P *21/00*
U.S. Cl. 424—177 **14 Claims**

1. A protein fraction which is selected from the group consisting of KS-I, KS-II and KS-III which is prepared by the process of

culturing a pathogenic strain of *Bordetella pertussis*,

isolating from the cultured cells or culture medium a protein which has a molecular weight of 77,000±6,400 as determined by gel filtration and has insulin secretion promoting activity for a mammal, which protein in 0.1 M phosphate buffer (pH 7.0) is adsorbed on a hydroxyapatite column and eluted therefrom with 0.1 M phosphate buffer of pH 7.0 containing 0.5 M NaCl and which protein in SDS-polyacrylamide-gel electrophoresis, wherein an incubated mixture of 1% SDS, 1% mercaptoethanol and 4 M urea with 50 μg/tube of said protein is applied to 10% polyacrylamide-gel containing 1% SDS in 4-hour current application of 8 mA/gel, gives three main peptide-bands,

mixing said protein into a solution of protein denaturant to dissociate it and

recovering from the resultant mixture said protein fraction characterized by the following properties:

KS—I

molecular weight: 63,000±5,200 as determined by gel filtration;

chemical composition: protein content as determined by the Lowry's method being ocer 97% by weight, the glucide content by the phenol-H_2SO_4 method being about 1% by weight and the lipid content being lower than the limit of detection,

the amino acids composition of the protein moiety: asparatic acid 8.1%; threonine 8.5%; serine 7.9%; glutamic acid 9.6%; proline 5.0%; glycine 10.0%; alanine 9.5%; cystine/2 1.1%; valine 6.2%; methionine 1.8%; isoleucine 4.5%; leucine 6.5%; tyrosine 7.6%; phenylalanine 2.8%; lysine 2.1%; histidine 1.6% and arginine 7.3%;

isoelectric pH value of 5.6±0.3, and

disc electrophoretic pattern, using acrylamide (polyacrylamide concentration, 7.5%; 1 N KOH-glacial acetic acid buffer (pH 4.3)) disc electrophoresis, giving a very sharp single band on the anode side;

KS—II

molecular weight: 31,000±4,500 as determined by gel filtration;

chemical composition: protein content as determined by the

Lowry method being over 95% by weight, the glucide content by the phenol-H_2SO_4 method being about 1% by weight and the lipid content being lower than the limit of detection;

the amino acid composition of the protein moiety: asparatic acid 9.3%; threonine 7.7%; serine 9.8%; glutamic acid 11.8%; proline 4.6%; glycine 9.8%; alanine 11.3%; cystine/2 N.D.; valine 7.4%; methionine 1.9%; isoleucine 4.0%; leucine 5.3%; tyrosine 6.2%; phenylalanine 2.5%; lysine 1.9%; histidine 1.1%; and arginine 5.4%;

isoelectric pH value of 5.4±0.4 and

disc electrophoretic pattern, using acrylamide (polyacrylamide concentration 7.5%; 1 N KOH-glacial acetic acid buffer (pH 4.3)) disc electrophoresis, giving a very sharp single band on the anode side;

KS—III

molecular weight: 12,000±1,500 as determined by gel filtration,

chemical composition: protein content as determined by the Lowry method being over 96% by weight the glucide content by the phenol-H_2SO_4 method being about 1% by weight and the lipid content being lower than the limit of detection,

the amino acids composition of the protein moiety: asparatic acid 5.3; threonine 4.8%; serine 6.2%; glutamic acid 9.6%; proline 9.3%; glycine 8.1%; alanine 9.3%; cystine/2 2.3%; valine 10.2%; methionine 6.0%; isoleucine 2.2%; leucine 8.6%; tyrosine 2.5%; phenylalanine 4.5%; lysine 5.8%; histidine 0.5%; and arginine 4.8%;

isoelectric pH value of 8.3±0.3, and

disc electrophoretic pattern using acrylamide (polyacrylamide concentration 7.5%; 1 N KOH-glacial acetic acid buffer (pH 4.3)) disc electrophoresis, giving a very sharp single band on the cathode side.

4,234,571

NONAPEPTIDE AND DECAPEPTIDE DERIVATIVES OF LUTEINIZING HORMONE RELEASING HORMONE

John J. Nestor, San Jose; Gordon H. Jones, and Brian H. Vickery, both of Cupertino, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jun. 11, 1979, Ser. No. 47,661
Int. Cl.³ A61K *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **15 Claims**

1. A compound of the formula

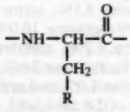
(pyro)Glu-His-V-Ser-W-X-Y-Arg-Pro-Z (I)

and the pharmaceutically acceptable salts thereof wherein:

V is tryptophyl, phenylalanyl or 3-(1-naphthyl)-L-alanyl;

W is tyrosyl, phenylalanyl or 3-(1-pentafluorophenyl)-L-alanyl;

X is a D-amino acid residue



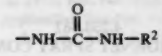
wherein R is

(a) a carbocyclic aryl-containing radical selected from the group consisting of naphthyl, anthryl, fluorenyl, phenanthryl, biphenylyl, benzhydryl and phenyl substituted with three or more straight chain lower alkyl groups; or

(b) a saturated carbocyclic radical selected from the group consisting of cyclohexyl substituted with three or more straight chain lower alkyl groups, perhydronaphthyl, perhydrobiphenylyl, perhydro-2,2-diphenylmethyl and adamantyl;

Y is leucyl, isoleucyl, nor-leucyl or N-methyl-leucyl;

Z is glycinamide or —NH—R^1, wherein R^1 is lower alkyl, cycloalkyl, fluoro lower alkyl or



wherein

R^2 is hydrogen or lower alkyl.

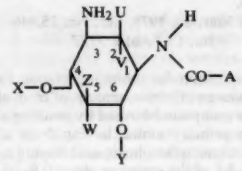
4,234,572

1-N-4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINO-CYCLITOL DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Uwe Petersen, Leverkusen; Eckart Voss, Cologne; Karl G. Metzger, Wuppertal, and Peter Stadler, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 960,205
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1977, 2753769
Int. Cl.³ A61K *31/71;* **C07H** *15/22*
U.S. Cl. 424—180 **23 Claims**

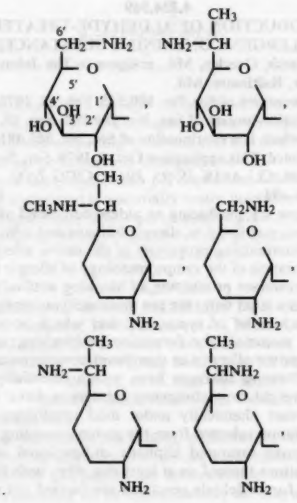
1. A compound of the formula



(I)

or a pharmaceutically acceptable salt thereof, in which

X denotes a radical of the formula



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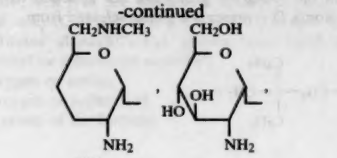
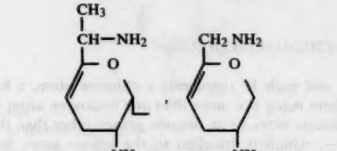
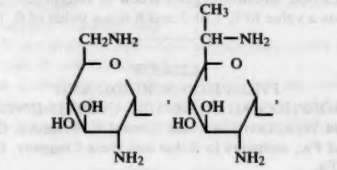
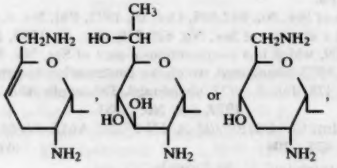
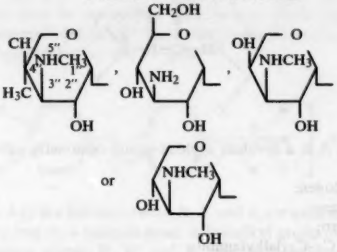








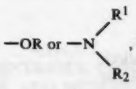
Y denotes a radical of the formula



U, V, and W independently denote a hydrogen atom or a hydroxyl group, but U and V cannot be OH simultaneously

Z denotes a hydrogen atom or a hydroxyl or amino group, and

A denotes a radical



in which

R denotes an alkyl radical with 1 to 10 carbon atoms, which is unsubstituted or substituted by 1 or 2 substituents selected from halogen; hydroxyl; mercapto; cyano; carboxyl. trifluoromethyl; alkoxy and alkylthio with 1 to 6 carbon atoms; allyloxy; phenoxy; alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl radical and cycloalkyl with 3 to 6 carbon atoms in the ring; and a radical of the general formula

in which

R_6 denotes a hydrogen atom, a C_1 to C_8 alkyl group or an allyl group and

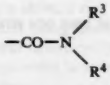
R_7 denotes a hydrogen or a C_1 to C_8 alkyl, C_5 to C_7 cycloalkyl, C_5 to C_7 cycloalkyl-C_1 to C_4 alkyl, phenyl, phenyl-C_1 to C_4 alkyl or allyl group, and

in which

the alkyl, cycloalkyl and phenyl radicals R_6 and R_7 are unsubstituted or substituted by one or two substituents selected from alkoxy with 1 to 4 carbon atoms, amino, monoalkylamino and dialkylamino with 1 to 4 carbon atoms per alkyl group in each case and hydroxyl; or R denotes an alkenyl radical with 3 to 7 carbon atoms; or denotes an alkinyl radical with 3 or 4 carbon atoms; or denotes a monocyclic or bicyclic cycloalkyl radical with 3 to 7 carbon atoms, which is unsubstituted or contains 1, 2 or 3 substituents selected from alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, hydroxyl, amino and alkylamino and dialkylamino with 1 to 4 carbon atoms per alkyl group, or denotes a phenyl radical or benzyl radical, which is unsubstituted or substituted by nitro, halogen or alkoxy with 1 to 4 carbon atoms; or denotes a piperidinyl, tetrahydropyranyl, tetrahydrofuryl, 1,3-dioxolanyl or 1,3-dioxolano[d,b]tetrahydrofuryl radical, which is unsubstituted or substituted by 1 or 2 radicals selected from alkoxy with 1 to 4 carbon atoms, hydroxyl, alkyl with 1 to 4 carbon atoms and 2,2-dimethyl-1,3-dioxolan-4-yl; or denotes a 1,3-dioxolanylalkyl, tetrahydrofurylalkyl, tetrahydropyranylalkyl, oxetanylalkyl, 1,3-oxathiolanylalkyl, 1,3-dithiolanylalkyl, 1,4-dioxaspiro[4,5]decanyl, alkyl, oxiranylalkyl, piperidinylalkyl, tetrahydropyridinylalkyl or aziridinylalkyl radical in which the alkyl radical contains 1 to 4 carbon atoms and which is unsubstituted or carries 1 or 2 substituents selected from alkyl with 1 to 4 carbon atoms, phenyl and alkoxy with 1 to 4 carbon atoms, and

R^1, independently of R, has any of the meanings indicated for R or denotes a hydrogen atom; and

R^2 independently of R has any of the meanings given for R or denotes a hydrogen atom or a 1-B-tetra-O-ocetyl-D-glucosyl, 1-B-D-glucosyl, tetrahydropyridinyl, morpholino, piperidino, alkoxy with 1 to 4 carbon atoms, cyclopentyloxy, cyclohexyloxy, benzyloxy which is optionally substituted by halogen, tetrahydropyranyloxy, tetrahydrofuranyloxy, hydroxyl, amino, alkylamino and dialkylamino with 1 to 4 carbon atoms per alkyl group, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl radical, or allyloxycarbonyl group or a group of the formula



in which

R^3 independently of R^1 has any of the meanings given for R^1, and

R^4 denotes a hydrogen atom, an alkyl radical with 1 to 10, carbon atoms, which optionally carries 1 or 2 substituents selected from halogen, hydroxyl, mercapto, cyano, trifluoromethyl, alkoxy with 1 to 6 carbon atoms, allyloxy, phenoxy, amino, alkylamino and dialkylamino with 1 to 4 carbon atoms per alkyl group, the alkylamino groups mentioned being unsubstituted or substituted by —OH, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl

radical and cycloalkyl with 3 to 6 carbon atoms in the ring, or denotes a monocyclic or bicyclic cycloalkyl radical with 3 to 7 carbon atoms, which can contain 1, 2 or 3 substituents selected from alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, hydroxyl, amino or alkylamino or dialkylamino with 1 to 4 carbon atoms per alkyl group; or denotes a hydroxyl, alkoxy with 1 to 4 carbon atoms, or amino group or an alkylamino or dialkylamino group with 1 to 4 carbon atoms per alkyl group, or R^1 and R^2 or R^3 and R^4, including the N atom to which they are bonded, form a pyrrolidino, piperidino, morpholino, piperazin-4-yl, hexamethyleneimino, isoxazolin-2-yl or tetrahydroisoxazin-2-yl ring, which optionally carries 1 or 2 alkyl groups with 1 to 4 carbon atoms, which can be substituted by hydroxyl.

19. A method of combating bacterial infections in warm-blooded animals which comprises administering to the animals an antimicrobially effective amount of an active compound according to claim **1** either alone or in admixture with a diluent or in the form of a medicament.

4,234,573

1-TRIMETHYLSILYLPHENYL-3-MONO- AND -DI-HALOBENZOYL-UREAS, INSECTICIDAL COMPOSITIONS CONTAINING THEM AND THEIR USE IN CONTROLLING INSECT PESTS

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

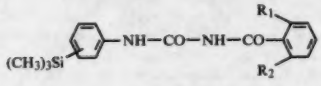
Filed Jun. 7, 1979, Ser. No. 46,288

Claims priority, application Switzerland, Jun. 15, 1978, 6533/78

Int. Cl.[3] **A01N** *55/00;* **C07F** *7/02*

U.S. Cl. 424—184 **8 Claims**

1. A compound of the formula I



(I)

wherein R_1 is fluorine or chlorine and R_2 is hydrogen, fluorine or chlorine.

4,234,574

SILOXANES

Stephen Westall, Barry, Wales, assignor to Dow Corning Limited, London, England

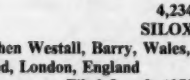
Filed Jun. 8, 1979, Ser. No. 47,192

Claims priority, application United Kingdom, Jun. 23, 1978, 27799/78

Int. Cl.[3] **C07F** *7/18;* **A01N** *9/00;* **A61K** *31/695*

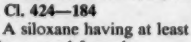
U.S. Cl. 424—184 **4 Claims**

1. A siloxane having at least one structural unit represented by the general formula



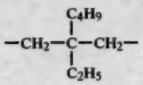
(I)

any remaining units in the siloxane being those represented by the general formula

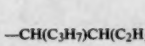


(II)

wherein X represents a hydrogen atom or a chemical bond linking the adjacent oxygen atom to the silicon atom of a silyl or siloxy group (with the proviso that both of the oxygen atoms in the XOQO— group are not attached to the same silicon atom), Q represents a group selected from



and



each R and each R′ represents a chlorine atom, a hydrogen atom, there being not more than one hydrogen atom attached to any silicon atom, or an organic group, other than the group XOQO—, which is attached to the silicon atom through a silicon carbon, silicon-oxygen-carbon or silicon-nitrogen linkage, a has a value of 0, 1 or 2 and b has a value of 0, 1, 2 or 3.

4,234,575

PHOSPHONOUREIDE AND PHOSPHONOTHIOUREIDE ANTHELMINTICS

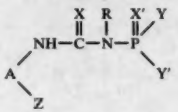
W. David Weir, Levittown, and Edward E. Kilbourn, Chalfont, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 842,645, Oct. 10, 1977, Pat. No. 4,183,921, which is a division of Ser. No. 625,998, Oct. 28, 1975, Pat. No. 4,076,809, which is a continuation-in-part of Ser. No. 354,629, Apr. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 263,378, Jun. 5, 1972, abandoned. This application Jan. 31, 1979, Ser. No. 7,881

Int. Cl.[3] **C07F** *9/02;* **A01N** *57/00;* **A61K** *31/66*

U.S. Cl. 424—204 **41 Claims**

1. A compound of the formula:



wherein A is a divalent arylene group optionally substituted with

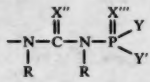
(a) halogen;
(b) cyano;
(c) nitro;
(d) di(C_1–C_{18})alkylamino;
(e) vicinal alkylene of from 2 to 6 carbon atoms; or
(f) a group of the formula: $R^1(A')_a$

wherein R^1 is

1. an alkyl group of from 1 to 4 carbon atoms;
2. a substituted or unsubstituted aromatic group containing from 6 to 10 atoms in the aromatic ring;

A′ is oxygen, sulfur, sulfinyl, sulfonyl or carbonyl; and
a is an integer of 0 to 1;
R is
(a) hydrogen;
(b) (C_1–C_{10})alkyl;
(c) (C_1–C_{10})haloalkyl;
(d) (C_3–C_6)cycloalkyl;
(e) (C_2–C_{11})alkoxyalkyl;
(f) (C_1–C_{10})cyanoalkyl;
(g) (C_3–C_6)alkenyl;
(h) (C_3–C_6)haloalkenyl;
(i) (C_3–C_6)alkynyl;
(j) (C_3–C_6)haloalkynyl;
(k) optionally substituted aralkyl of up to 11 carbon atoms; or
(l) substituted or unsubstituted (C_6–C_{10})aryl;
Y is R′, OR′, N(R′)$_2$ or SR′ and

Y' is OR', $N(R')_2$ or SR' wherein R' is alkyl(C_1–C_4), substituted alkyl(C_1–C_4), aralkyl(C_7–C_{10}), alkenyl (C_1–C_4), substituted alkenyl(C_1–C_4), phenyl, substituted phenyl, naphthyl or substituted naphthyl;
X is oxygen or sulfur;
X' is oxygen or sulfur; and
Z is a group of the formula:



wherein
R is as above defined;
X'' is oxygen or sulfur, provided that when X'' is sulfur, X is oxygen;
X''' is oxygen or sulfur; and
Y and Y' are as above defined; or a pharmaceutically acceptable salt of said compound.

11. An anthelmintic composition for oral administration comprising an anthelmintically effective amount of the compound of claim **1** and a pharmaceutically acceptable carrier.

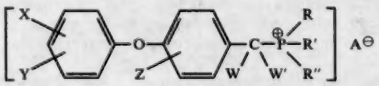
4,234,576

PHENOXYBENZYLPHOSPHONIUM SALT PESTICIDES

Michael J. Brown, Randolph Township, Morris County, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 861,204, Dec. 16, 1977, Pat. No. 4,162,313. This application Apr. 5, 1979, Ser. No. 27,609
Int. Cl.[2] A01N *9/36*
U.S. Cl. 424—211 **15 Claims**

1. A process for controlling plant insects which comprises contacting said insects with an insecticidally effective amount of a compound having the formula:



wherein $A\ominus$ is a halogen anion; X, Y and Z are each independently hydrogen, a halogen atom or haloalkyl group of from 1 to 4 carbon atoms; R, R' and R'' are each independently phenyl, halophenyl, haloalkylphenyl of from 7 to 12 carbon atoms or alkyl of from 1 to 6 carbon atoms, optionally substituted with halogen; W is —CHO or $—CHN(R''')_2$ where each R''' is independently hydrogen or alkyl of from 1 to 4 carbon atoms, optionally substituted with halogen; and W' is hydrogen or represents a bond forming a double bond between C and W.

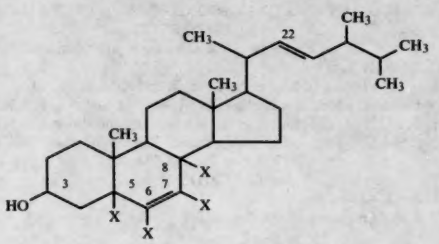
4,234,577

ERGOSTADIENTRIOLS, COMPOSITIONS CONTAINING SAME, AND METHODS OF PREPARING AND USING SAME

Fritz W. Zilliken, Remagen, Fed. Rep. of Germany, assignor to Z-L Limited Partnership, Janesville, Wis.

Continuation-in-part of Ser. No. 804,594, Jun. 8, 1977, Pat. No. 4,157,984. This application Mar. 19, 1979, Ser. No. 22,202
Int. Cl.[3] A61K *31/56;* **A01N** *45/00*
U.S. Cl. 424—238 **17 Claims**

1. A composition useful as an antioxidant which comprises an effective antioxidative amount of a compound having the structure:



wherein X may be hydrogen or a hydroxyl group provided that X twice be hydroxyl and a carrier selected from the group consisting of edible foods, fats and oils.

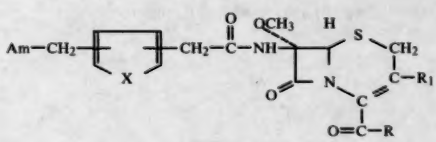
4,234,578

AMINOETHYL-METHOXY-CEPHALOSPORIN COMPOUNDS

Beat Müller, Reinach; Peter Schneider, Basel; Heinrich Peter, and Hans Bickel, both of Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 592,497, Jul. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 505,887, Sep. 13, 1974, abandoned. This application Jun. 5, 1978, Ser. No. 912,822
Claims priority, application Switzerland, Oct. 1, 1973, 14034/73; Jan. 21, 1974, 785/74; Jul. 12, 1974, 9640/74; Jul. 12, 1974, 9641/74; Feb. 7, 1975, 1551/75
Int. Cl.[3] C07D *501/57*
U.S. Cl. 424—246 **16 Claims**

1. A compound of the formula



wherein Am represents an unsubstituted amino, lower alkylamino or di-lower alkyl-amino, wherein lower alkyl contains up to 4 carbon atoms, X represents oxygen or sulphur, and the Am-methyl-substituted radical represents Am-methyl-2- or -3-thienyl, or Am-methyl-2-furyl, wherein R_1 denotes lower alkoxy or the group of the formula $—CH_2R_2$, in which R_2 denotes hydrogen, lower alkanoyloxy, carbamoyloxy, N-lower alkyl or N-halogeno-lower alkylcarbamoyloxy unsubstituted or substituted heterocyclylthio, wherein heterocyclyl represents a monocyclic, five-membered aromatic heterocyclic radical, which is bonded to the thio sulphur atom via a ring carbon atom and which contains 2 or 3 ring nitrogen atoms or additionally a ring oxygen atom, a ring sulphur atom or a ring nitrogen atom, said radical being unsubstituted or substituted by lower alkyl, or wherein heterocyclyl represents an unsaturated monocyclic, six-membered heterocyclic radical, which is bonded to the thio sulphur atom via a ring carbon atom and which contains 2 ring nitrogen atoms, and in which either a ring nitrogen atom carries an oxido group or a ring carbon atom carries an oxo group, said heterocyclyl radical being unsubstituted or substituted by lower alkyl, lower alkoxy or halogen, or R_2 denotes a pyridinium radical, which can be substituted by carboxyl, carbamoyl or hydrazinocarbonyl, and wherein R represents hydroxyl, and pharmaceutically acceptable salts thereof.

7. A pharmaceutical preparation comprising an antibiotically effective amount of a compound of claim **1** and a pharmaceutically utilizable excipient.

4,234,579

PENICILLANIC ACID 1,1-DIOXIDES AS β-LACTAMASE INHIBITORS

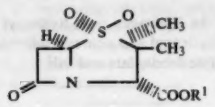
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 890,451, Mar. 29, 1978, abandoned, which is a continuation-in-part of Ser. No. 879,381, Feb. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 804,320, Jun. 7, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,700

Int. Cl.[3] **C07D** *277/60*

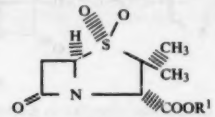
U.S. Cl. 424—246 **26 Claims**

1. A compound of the formula



and the pharmaceutically-acceptable base salts thereof, wherein R^1 is selected from the group consisting of hydrogen, alkanoyloxymethyl having from 3 to 8 carbon atoms, 1-(alkanoyloxy)ethyl having from 4 to 9 carbon atoms, 1-methyl-1-(alkanoyloxy)ethyl having from 5 to 10 carbon atoms, alkoxycarbonyloxymethyl having from 3 to 6 carbon atoms, 1-(alkoxycarbonyloxy)ethyl having from 4 to 7 carbon atoms, 1-methyl-1-(alkoxycarbonyloxy)ethyl having from 5 to 8 carbon atoms, N-(alkoxycarbonyl)aminomethyl having from 3 to 9 carbon atoms, 1-(N-[alkoxycarbonyl]-amino) ethyl having from 4 to 10 carbon atoms, 3-phthalidyl, 4-crotonolactonyl, γ-butyrolacton -4-yl, tetrahydropyranyl, benzyl, 4-nitrobenzyl, benzyhdryl, 2,2,2-trichloroethyl, t-butyl and phenacyl.

10. A pharmaceutical composition useful for treating bacterial infections in mammals which comprises (A) a β-lactam antibiotic and (B) a compound of the formula



or a pharmaceutically acceptable base salt thereof, the weight ratio of (A) to (B) being 1:3 to 3:1, R^1 being selected from the group consisting of hydrogen, alkanoyloxymethyl having from 3 to 8 carbon atoms, 1-(alkanoyloxy)ethyl having from 4 to 9 carbon atoms, 1-methyl-1-(alkanoyloxy)ethyl having from 5 to 10 carbon atoms, alkoxycarbonyloxymethyl having from 3 to 6 carbon atoms, 1-(alkoxycarbonyloxy)ethyl having from 4 to 7 carbon atoms, 1-methyl-1-(alkoxycarbonyloxy)-ethyl having from 5 to 8 carbon atoms, N-(alkoxycarbonyl)aminomethyl having from 3 to 9 carbon atoms, 1-(N-[alkoxycarbonyl-]amino)ethyl having from 4 to 10 carbon atoms, 3-phthalidyl, 4-crotonolactonyl and γ-butyrolacton-4-yl, and said β-lactam anti-biotic being selected from the group consisting of:

6-(2-phenylacetamido)penicillanic acid,
6-(2-phenoxyacetamido)penicillanic acid,
6-(2-phenylpropionamido)pencillanic acid,
6-(D-2-amino-2-phenylacetamido)pencillanic acid,
6-(D-2-amino-2-[4-hydroxyphenyl]acetamido)penicillanic acid,
6-(D-2-amino-2-[1,4-cyclohexadienyl]acetamido)penicillanic acid,
6-(1-aminocyclohexanecarboxamido)penicillanic acid,
6-(2-carboxy-2-phenylacetamido)penicillanic acid,
6-(2-carboxy-2-[3-thienyl]acetamido)penicillanic acid,
6-(D-2-[4-ethylpiperazin-2,3-dione-1-carboxamido]-2-phenylacetamido)penicillanic acid,
6-(D-2-[4-hydroxy-1,5-naphthyridine-3-carboxamido]-2-phenylacetamido)-penicillanic acid,
6-(D-2-sulfo-2-phenylacetamido)penicillanic acid,
6-(D-2-sulfoamino-2-phenylacetamido)penicillanic acid,
6-(D-2-[imidazolidin-2-one-1-carboxamido]-2-phenylacetamido)penicillanic acid,
6-(D-[3-methylsulfonylimidazolidin-2-one-1-carboxamido]-2-phenylacetamido)penicillanic acid,
6-([hexahydro-1H-azepin-1-yl]methyleneamino)penicillanic acid,
acetoxymethyl 6-(2-phenylacetamido)penicillanate,
acetoxymethyl 6-(D-2-amino-2-phenylacetamido)penicillanate,
acetoxymethyl 6-(D-2-amino-2-[4-hydroxyphenyl]acetamido)-penicillanate,
pivaloyloxymethyl 6-(2-phenylacetamido)penicillanate,
pivaloyloxymethyl 6-(D-2-amino-2-phenylacetamido)penicillanate,
pivaloyloxymethyl 6-(D-2-amino-2-[4-hydroxyphenyl-]acetamido)penicillanate,
1-(ethoxycarbonyloxy)ethyl 6-(2-phenylacetamido)penicillanate,
1-(ethoxycarbonyloxy)ethyl 6-(D-2-amino-2-phenylacetamido)penicillanate,
1-(ethoxycarbonyloxy)ethyl 6-(D-2-amino-2-[4-hydroxyphenyl]acetamido)penicillanate,
3-phthalidyl 6-(2-phenylacetamido)penicillanate,
3-phthalidyl 6-(D-2-phenylacetamido)penicillanate,
3-phthalidyl 6-(D-2-amino-2-[4-hydroxyphenyl]acetamido)-penicillanate,
6-(2-phenoxycarbonyl-2-phenylacetamido)penicillanic acid,
6-(2-tolyloxycarbonyl-2-phenylacetamido)penicillanic acid,
6-(2-[5-indanyloxycarbonyl]-2-phenylacetamido)penicillianic acid,
6-(2-phenoxycarbonyl-2-[3-thienyl]acetamido)penicillanic acid,
6-(2-tolyloxycarbonyl-2-[3-thienyl]acetamido)penicillanic acid,
6-(2-[5-indanyloxycarbonyl]-2-[3-thienyl]acetamido)penicillanic acid,
6-(2,2-dimethyl-5-oxo-4-phenyl-1-imidazolidinyl)penicillanic acid,
7-(2-[2-thienyl]acetamido)cephalosporanic acid,
7-(2-[1-tetrazolyl]acetamido-3-(2-[5-methyl-1,3,4-thiadiazolyl]-thiomethyl)-3-desacetoxymethylcephaosporanic acid,
7-(D-2-amino-2-phenylacetamido)desacetoxycephalosporanic acid,
7-α-methoxy-7-(2-[2-thienyl]acetamido)-3-carbamoyloxymethyl-3-deacetoxymethylcephalosporanic acid,
7-(2-cyanoacetamido)cephalosporanic acid,
7-(D-2-hydroxy-2-phenylacetamido)-3-(5-[1-methyltetrazolyl]-thiomethyl)-3-desacetoxymethylcephalosporanic acid,
7-(2-[4-pyridylthio]acetamido)cephalosporanic acid,
7-(D-2-amino-2-[1,4-cyclohexadienyl]acetamido)cephalosporanic acid,
7-(D-2-amino-2-phenylacetamido)cephalosporanic acid, and the pharmaceutically-acceptable salts thereof.

4,234,580

CARBAMATE THIOSULFENYLCARBAMOYL FLUORIDE COMPOUNDS

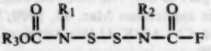
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,996

Int. Cl.[3] **C07C** *124/04, 125/06;* **A01N** *9/12;* **C07C** *125/04*

U.S. Cl. 424—246 **32 Claims**

1. A compound of the formula:



wherein:

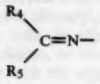
R_1 and R_2 are the same or different and are alkyl groups having from one to four carbon atoms;

R_3 is:

(A) alkyl, cycloalkyl, alkenyl or alkyenyl; or

(B) dihydrobenzofuranyl, naphthyl, tetrahydronaphthyl, benzothienyl, indanyl, benzodioxalanyl, benzofuranyl, benzodioxanyl, or methylenedioxyphenyl all of which may be either unsubstituted or substituted with one or more alkyl groups; or

(C) phenyl, either unsubstituted or substituted with one or more halo, cyano, nitro, cycloalkyl, alkyl, alkylthio, alkynyl, alkenyl, alkylsulfinyl, alkylsulfonyl, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, amino, alkylamino, dialkylamino, alkynylthio, alkenylthio, alkoxycarbonylamino, trihalomethyl , dialkylaminoalkyleneamino, formamidino or alkoxy, or



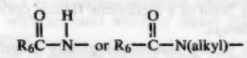
(D)

or AC=N, wherein:

R_4 is hydrogen, alkyl, alkylthio, alkylsulfinyl, alkylsulfonyl or cyano;

R_5 is alkyl, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy, alkanoyl, aroyl, alkoxycarbonyl, phenyl, aminocarbonyl, alkylaminocarbonyl or dialkyoaminocarbonyl all of which may be unsubstituted or, except aminocarbonyl, substituted with one or more cyano, nitro, alkylthio, alkylsulfonyl, alkoxy, aminocarbonyl alkylaminocarbonyl,

dialkylaminocarbonyl or R_5 is a



where R_6 is hydrogen, alkyl or alkoxy;

A is a divalent alkylene chain completing a 2-oximino-1,4-dithiane, 2-oximino-1,3-dithiane, 4-oximino-1,3-dithiolane, 2-oximino-1,4-dioxane, 2-oximino-tetrahydro-1,4-thiazine-3-one, 2-oximino-1,3-dithiolane, 3-oximino-thiophane, 2-oximinothiophane, 2-oximino-tetrahydro-1,4-oxazin-3-one, 2-oximino-1,3,5-trithiane, 4-oximino-1,3,5-oxadithiane, 2-oximino-1,4-oxathiane, 4-oximino-1,3-oxathiolane, 2-oximino-thiazolidin-3-one, 2-oximino-1,3-thiazolidin-4-one or 2-oximino-tetrahydro-1,4-thiazin-5-one ring, wherein sulfur may be any of its oxidation states;

with the proviso that R_3, R_4, R_5 and R_6 substituents individually may not include more than eight aliphatic carbon atoms.

4,234,581

THIENO[2,3-D]OXAZINES

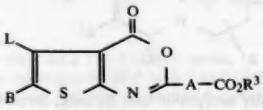
Davis L. Temple, Jr., Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 826,591, Sep. 10, 1975, Pat. No. 4,159,377, which is a continuation-in-part of Ser. No. 611,955, Sep. 10, 1975, Pat. No. 4,054,656. This application Mar. 30, 1979, Ser. No. 25,295

Int. Cl.[3] **A61K** *31/38;* **C07D** *498/04*

U.S. Cl. 424—248.51 **26 Claims**

1. The compound having Formula V



Formula V

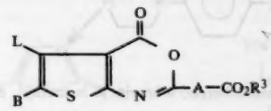
wherein

R^3 is selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, and M wherein M is a non-toxic pharmacologically inert metal cation, and

A is a covalent bond or it is —CH=CH—,

L and B are independently selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, lower alkenyl having 3 to 6 carbon atoms, phenyl, and alkanoyl having 2 to 6 carbon atoms, or together they constitute cycloalkene having 5 to 7 carbon atoms, or R-substituted cycloalkene having 5 to 7 carbon atoms wherein R is lower alkyl having 1 to 8 carbon atoms.

22. A method of inhibiting the immediate hypersensitivity reaction in a sensitive mammal which comprises administering to said mammal an effective hypersensitivity reaction inhibiting dose of a compound selected from the group consisting of substances having Formula V



Formula V

wherein

R^3 is selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, and M wherein M is a non-toxic pharmacologically inert metal cation,

A is a covalent bond or it is —CH=CH—, and

L and B are independently selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, lower alkenyl having 3 to 6 carbon atoms, phenyl, and alkanoyl having 2 to 6 carbon atoms, or together they constitute cycloalkene having 5 to 7 carbon atoms, or R-substituted cycloalkene having 5 to 7 carbon atoms wherein R is lower alkyl having 1 to 8 carbon atoms.

4,234,582

TRIALKYL ISOCYANATES USED AS PESTICIDES

Hironobu Takahashi; Masamitus Honda; Yasushi Murakami, all of Tokyo, and Yoshitaka Iwane, Yokohama, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1979, Ser. No. 32,091

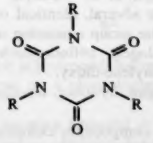
Claims priority, application Japan, May 10, 1978, 53/54436; Jul. 11, 1978, 53/83522

Int. Cl.[3] **A01N** *43/64*

U.S. Cl. 424—249 **13 Claims**

1. A method for controlling household insect pests, agricultural vermin pests, and noxious insect pests that plague wood or cellulosic materials, comprising:

placing a pesticidally effective amount, at a locus in which the pests will come into contact therewith, of a trialkyl isocyanurate of the formula



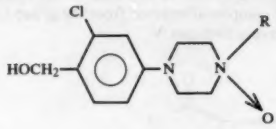
wherein R is an alkyl group having 2–4 carbon atoms.

4,234,583
2-CHLORO-4-(4-LOWER ALKYL-1-PIPERAZINYL)BENZENEMETHANOL, N^{ω}-OXIDES AND METHODS FOR THEIR PREPARATION

Ernest Bueding, Baltimore, Md.; Leslie M. Werbel, and Donald F. Worth, both of Ann Arbor, Mich., assignors to Edna McConnell Clark Foundation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,371
Int. Cl.[3] A61K *31/495;* C07D *295/00*
U.S. Cl. 424—250 5 Claims

1. A compound of the formula



and acid addition salts thereof wherein R is methyl, ethyl, propyl, or isopropyl.

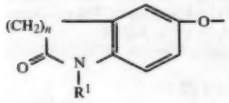
5. A method for treating schistosomiasis which comprises administering to a patient afflicted therewith an anti-schistosomiasis effective amount of a compound according to claim 1.

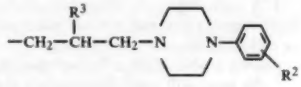
4,234,584
SUBSTITUTED PHENYLPIPERAZINE DERIVATIVES

Rudolf Lattrell, Königstein; Wilhelm Bartmann, Bad Soden am Taunus, and Hermann Gerhards, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 4, 1979, Ser. No. 44,948
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1978, 2824677; Dec. 14, 1978, 2853996
Int. Cl.[3] A61K *31/495;* C07D *401/12*
U.S. Cl. 424—250 4 Claims

1. A phenylpiperazine compound of the formula





or a physiologically acceptable salt thereof, wherein

R^1 denotes hydrogen or C_1–C_6alkyl,

R^2 denotes one or several, identical or different, members selected from the group consisting of C_1–C_6-alkyl, C_1–C_6alkoxy, halogen, trifluoromethyl, hydroxy, nitro, amino, and methylene-dioxy,

R^3 denotes hydrogen, hydroxy, C_1–C_6alkanoyloxy, and

n is 1 or 2.

2. A neuroleptic composition comprising a compound as defined in claim 1 and a physiologically acceptable auxiliary agent or carrier therefor.

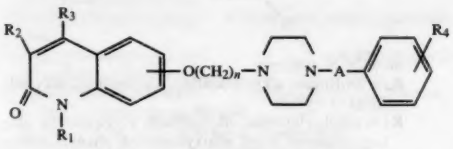
4,234,585
1,2-DIHYDROQUINOLINE-2-ONE DERIVATIVES

Werner Winter, Heppenheim; Walter-Gunar Friebe, Darmstadt; Wolfgang Kampe, Heddesheim; Androniki Roesch, Mannheim, and Otto-Henning Wilhelms, Weinheim-Rittenweier, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jun. 4, 1979, Ser. No. 45,472
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827566
Int. Cl.[3] A61K *31/495;* C07D *401/12*
U.S. Cl. 424—250 9 Claims

1. A (4-substituted-piperazin-1-yl)-alkoxy-2-oxo-1,2-dihydroquinoline of the formula:

(I)



in which

R_1, R_2 and R_3 each independently is hydrogen or an alkyl radical with 1 to 6 carbon atoms,

R_4 is hydrogen, halogen, or an alkyl or alkoxy radical with 1 to 6 carbon atoms,

n is 2, 3, 4 or 5 and

A is a valency bond or a methylene radical optionally substituted by phenyl,

or a salt thereof with a pharmacologically acceptable acid.

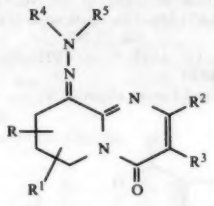
7. An anti-allergic and anti-hypertensive composition of matter comprising an anti-allergically anti-hypertensive effective amount of a compound or salt according to claim 1 in admixture with a pharmacologically acceptable diluent.

4,234,586
NITROGEN BRIDGEHEAD COMPOUNDS HAVING ANTI-ALLERGIC EFFECT

István Hermecz; Zoltán Meszáros; Tibor Breining; Sándor Virág; Lelle V. Vasvári nee Debreczy; Ágnes Horváth; Gábor Nagy; Attila Mándi; Tamás Szücs; István Bitter, and Gyula Sebestyán, all of Budapest, Hungary, assignors to Chinoin Gyógyszer és Vegyészeti Termékek Gyára Rt., Budapest, Hungary

Filed Dec. 11, 1978, Ser. No. 967,958
Claims priority, application Hungary, Dec. 29, 1977, CI 1794/77
Int. Cl.[3] A61K *31/505;* C07D *471/04*
U.S. Cl. 424—251 20 Claims

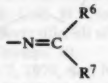
1. A compound of the formula:



or a pharmaceutically acceptable salt, hydrate, stereoisomer, optically active isomer, geometric isomer or tautomeric form thereof, wherein:

R is hydrogen or lower alkyl;

R^1 is hydrogen, lower alkyl, styryl or carboxy;
R^2 is hydrogen, lower alkyl or hydroxy;
R^3 is hydrogen, lower alkyl, phenyl, naphthyl, formyl, lower alkanoyl, carboxyl, lower alkoxycarbonyl, carbamoyl, —CO—NH—NH_2, cyano, —CH—NH—OH, or a group of the formulae —(CH_2)m—COOH, —(CH_2)m—COO—loweralkyl, —(CH_2)m—$CONH_2$, —(CH_2)m—N—H—NH_2, —(CH_2)m—CN or —(CH_2)m—CO—N—H—OH, wherein m=1, 2 or 3;
R^4 is hydrogen, lower alkyl, lower alkyl substituted by hydroxy or carboxy, trifluoromethyl, phenyl, naphthyl, phenyl or naphthyl substituted by at least one halogen, lower alkyl, lower alkoxy, lower alkylenedioxy, trifluoromethyl, nitro, aminosulfonyl, carboxyl, sulfo, hydroxy, or amino, phenyl-loweralkyl, 2-, 3-, or 4-pyridyl, benzothiazol-2-yl, methoxycarbonyl or ethoxycarbonyl; and
R^5 is hydrogen, lower alkanoyl, benzoyl or nicotinoyl; or
R^4 and R^5 together with the adjacent nitrogen atom form a piperidino, pyrrolidino, or morpholino ring; or
R^4 and R^5 together with the adjacent nitrogen atom form a group of the formula:



wherein R^6 is hydrogen and R^7 is phenyl or phenyl substituted by N,N-dimethylamino; or
R^4 and R^5 together form a 2-azepinylidene group.

18. An anti-asthma composition comprising as active ingredient a pharmaceutically effective amount of the compound defined in claim **1** or a pharmaceutically acceptable salt thereof in admixture with an inert solid or liquid pharmaceutically acceptable carrier.

20. A method of treating asthma in an animal subject comprising administering to said subject an effective amount of a compound as defined in claim **1** or a pharmaceutically acceptable salt thereof.

4,234,587

COMBATING PESTS WITH N,N-DIMETHYL-CARBAMIC ACID O-(2-SUBSTITUTED-METHYL-PYRIMIDIN-4-YL)-ESTERS

Fritz Maurer; Rolf Schröder, both of Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, and Paul-Ernst Frohberger, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

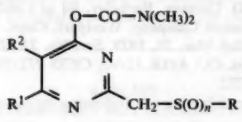
Filed Aug. 22, 1979, Ser. No. 68,795

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838359

Int. Cl.[3] **C07D** *239/34, 239/70, 239/90*

U.S. Cl. 424—251 **10 Claims**

1. An N,N-dimethyl-carbamic acid O-(2-substituted-methyl-pyrimidin-4-yl) ester of the formula



in which
R is alkyl with 1 to 5 carbon atoms,
R^1 is hydrogen or alkyl with 1 to 6 carbon atoms,
R^2 is hydrogen, alkyl with 1 to 6 carbon atoms or halogen, or
R^1 and R^2 together are alkylenyl with 3 to 5 carbon atoms, and
n is 1 or 2.

4,234,588

PYRIMIDINE COMPOUNDS

Thomas H. Brown, Welwyn Garden City, and Robert J. Ife, Stevenage, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

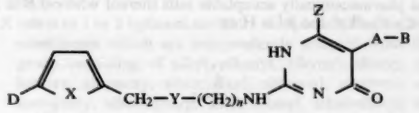
Filed Feb. 7, 1979, Ser. No. 9,990

Claims priority, application United Kingdom, Feb. 13, 1978, 5740/78; May 25, 1978, 22834/78; Nov. 13, 1978, 44259/78

Int. Cl.[3] **C07D** *401/12*

U.S. Cl. 424—251 **40 Claims**

1. A compound of the formula:



in which D is hydrogen or $R^1R^2N(CH_2)_m$—, R^1 and R^2 are hydrogen, lower alkyl, phenyl(lower alkyl) or R^1 and R^2 taken together with the nitrogen atom shown can form a pyrrolidino or piperidino group, m is from 1 to 6, X is oxygen or sulphur, Y is sulphur, oxygen or methylene, n is 2 or 3, Z is hydrogen or lower alkyl, A is C_1-C_5 alkylene or —$(CH_2)_pW(CH_2)_q$— where W is oxygen or sulphur and p and q are such that their sum is from 1 to 4, and B is a heteroaryl group selected from pyridyl, pyridyl N-oxide and 1,3-dioxolopyridyl optionally substituted by one or more of the groups lower alkyl, lower alkoxy, halo, hydroxy and amino, in the form of the free base or its pharmaceutically acceptable acid addition salts.

29. A pharmaceutical composition having histamine H_2-receptor blocking activity comprising in an effective amount to block said receptors a compound of claim **1** and a pharmaceutically acceptable diluent or carrier.

4,234,589

IMIDAZOLYLETHOXYMETHYL DERIVATIVES OF 1,3-DIOXOLO QUINOLINES

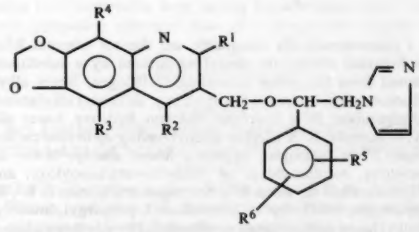
Hans Hoehn, Tegernheim, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 24, 1979, Ser. No. 78,344

Int. Cl.[3] **C07D** *491/056;* **A61K** *31/47*

U.S. Cl. 424—256 **12 Claims**

1. A compound of the formula



wherein R^1 to R^6 each is hydrogen, halogen, lower alkyl containing 1 to 7 carbons, on a physiologically acceptable acid addition salt thereof.

12. A method for treating bacterial or fungal infections in mammals which comprises administering to a mammalian host an effective amount of a compound as defined in claim **1**.

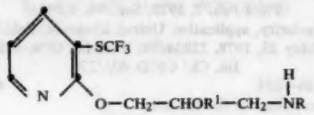
4,234,590

THIOSUBSTITUTED PYRIDINES

John J. Baldwin, and Gerald S. Ponticello, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 5, 1979, Ser. No. 9,008
Int. Cl.³ C07D *213/89*; A61K *31/44*
U.S. Cl. 424—263 **8 Claims**

1. A compound having the formula



and pharmaceutically acceptable salts thereof wherein R is H or C_1–C_6alkyl and R^1 is H or

wherein L is C_1–C_{10}alkyl, phenyl or substituted phenyl having up to two substituents independently selected from C_1–C_4alkoxy, halo and C_1–C_4alkyl.

8. A pharmaceutical composition for treating hypertension containing an effective amount of the compound of claim **1** and a carrier.

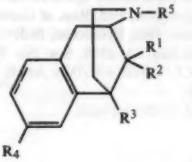
4,234,591

ANALGESIC AND MORPHINE-ANTAGONISTIC 9-PHENYL-6,7-BENZOMORPHANS

Antony M. Akkerman, Amsterdam; Hermanus C. C. K. Van Bakel, Montfoort, and Henriette G. van Breevoort-Uurbanus, Nieuw-Loosdrecht, all of Netherlands, assignors to ACF Chemiefarma N.V., Maarssen, Netherlands

Continuation of Ser. No. 804,149, Jun. 6, 1977, abandoned. This application May 4, 1979, Ser. No. 36,089
Claims priority, application United Kingdom, Jun. 21, 1976, 25577/76
Int. Cl.³ A61K *31/445*; C07D *221/26*
U.S. Cl. 424—267 **21 Claims**

1. A benzomorphan compound of the formula



or a pharmaceutically acceptable salt thereof wherein R^1 is unsubstituted phenyl or phenyl substituted by a substituent selected from the group consisting of halogen, lower alkyl, trifluoromethyl, hydroxy, lower alkoxy, di(lower) alkylamino, and piperidino; R^2 is hydrogen, halogen, hydroxy, lower alkoxy, or acetoxy; R^3 is alkyl or alkenyl having up to four carbon atoms; R^4 is hydrogen, hydroxy, lower alkoxy, lower alkanoyloxy, nicotinoyloxy, or phenylloweralkanoyloxy; and R^5 is loweralkyl or, when R^2 is hydrogen and is trans to R^3, R^5 is hydrogen, loweralkyl or loweralkenyl, propargyl, lowercycloalkyl being unsubstituted or substituted by one or two lower alkyl groups, lowercycloalkylloweralkyl wherein the lowercycloalkyl group is unsubstituted or substituted by one or two lower alkyl groups, lowercycloalkenylloweralkyl, cyanoloweralkyl, hydroxyloweralkyl, loweralkoxyloweralkyl, or phenylloweralkyl wherein the phenyl group is unsubstituted or substituted by lower alkoxy, halogen, or nitro.

20. The method of raising the pain threshold and/or counteracting the physiological effects of an opiate in a warm-blooded animal, which comprises administering to said animal an effective analgesic and/or morphine-antagonistic amount of a compound or salt as in claim **1**.

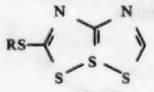
4,234,592

ALKYLTHIODIAZATRITHIAPENTALENE COMPOSITIONS AND METHODS OF USING AS PLANT DISEASE CONTROL AGENTS, INSECTICIDES, AND LARVICIDES

Thomas S. Woods, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 29, 1979, Ser. No. 42,944
Int. Cl.³ A01N *43/90*; C07D *513/04*
U.S. Cl. 424—270 **50 Claims**

1. A fungicidal, insecticidal and larvicidal essentially of an effective amount of a compound of the formula

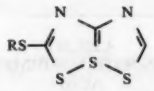


wherein

R is alkyl of C_1–C_{10}, optionally substituted with 1–2 chlorines; alkenyl of C_3–C_8, optionally substituted with 1–2 chlorines; cycloalkyl of C_3–C_{10}; cycloalkylalkyl of C_6–C_9; and $(CH_2)_nR'$, wherein n is 1–3 and R' is phenyl, optionally substituted with CH_3, CH_3O, NO_2, or 1–2 fluorines, chlorines, or bromines

and at least one of (a) a surfactant and (b) a solid or liquid diluent.

26. A method for controlling fungus diseases, and insect and larval pests which comprises applying to locus of infestation a pesticidally effective amount of a compound of the formula



wherein

R is alkyl of C_1–C_{10}, optionally substituted with 1–2 chlorines; alkenyl of C_3–C_8, optionally substituted with 1–2 chlorines; cycloalkyl of C_3–C_{10}; cycloalkylalkyl of C_6–C_9; and $(CH_2)_nR'$, wherein n is 1–3 and R' is phenyl, optionally substituted with CH_3, CH_3O, NO_2, or 1–2 fluorines, chlorines, or bromines.

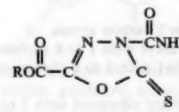
4,234,593

3-(N-ALKYLCARBAMYL)-5-(CARBOALKOXY)-1,3,4-OXADIAZOLE-2-THIONES AND THEIR USE AS ANTI-INFLAMMATORY AGENTS

Jack R. DeBaun, Sunnyvale; Ferenc M. Pallos, Walnut Creek, and Arnold D. Gutman, Berkeley, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

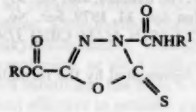
Filed Mar. 20, 1979, Ser. No. 22,129
Int. Cl.² A61K *31/42*; C07D *271/10*
U.S. Cl. 424—272 **3 Claims**

1. A compound having the following structural formula:



wherein R is alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

3. A method of treatment of an inflammatory condition in a mammal comprising administering to said mammal a therapeutically effective amount of a compound having the following structural formula:



wherein R is alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

4,234,594

PYRAZOLYL AMINO IMIDAZOLINES AS ANTIHYPERTENSIVE AGENTS

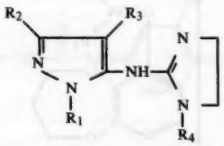
Martin Winn, Deerfield; Carl W. Nordeen, Waukegan, and David L. Arendsen, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 7, 1979, Ser. No. 36,884

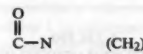
Int. Cl.[3] A61K *31/40, 31/47, 31/415, 31/435*

U.S. Cl. 424—273 P **9 Claims**

1. A method of treating hypertension in mammalian patients in need of such treatment which comprises administering to said patients a therapeutically effective amount of a compound of the formula



wherein R_1 and R_2 are hydrogen, loweralkyl, lowercycloalkyl, benzyl, phenyl or naphthyl, pyridyl, isoquinolyl or phthalazinyl, or phenyl or naphthyl substituted by one or more hydrogen, halo, loweralkyl, lowercycloalkyl, halololoweralkyl, aminosulfonyl, nitro, hydroxy, alkoxy, carboxy, alkoxycarbonyl, cycloalkoxy carbonyl, aminocarbonyl, diloweralkylaminocarbonyl or



wherein n is 4 or 5

R_3 is hydrogen, halogen, loweralkyl, phenyl or naphthyl, and

R_4 is hydrogen, acetyl, amino or loweralkyl, or the pharmaceutically acceptable acid addition salts thereof.

4,234,595

3-INDOLYL-TERTIARY BUTYLAMINOPROPANOLS

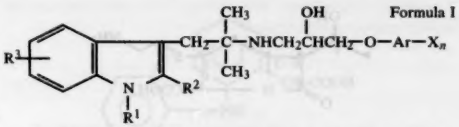
William E. Kreighbaum, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 815,138, Jul. 13, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,525

Int. Cl.[3] A61K *31/40;* **C07D** *209/12, 209/14*

U.S. Cl. 424—274 **106 Claims**

1. A compound having the formula



Formula I

and the acid addition salts thereof wherein one of

R^1 and R^2 is hydrogen and the other is hydrogen or alkyl having 1 to 4 carbon atoms,

R^3 is H, halogen, alkyl having 1 to 4 carbon atoms, or alkoxy having 1 to 4 carbon atoms and is located in the 4-, 5-, 6-, or 7- positions of the indole ring,

Ar is selected from the group consisting of phenyl and naphthyl,

X refers to 1 or 2 optional sterically compatible Ar-attached substituents which are independently selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, alkenoxy, alkynoxy, alkoxyalkyl, alkanoyl, alkenoyl, alkanoyloxy, alkenoyloxy, alkylsulfonyl, alkylsulfinyl, alkylthio, alkanoylamino, alkenoylamino, alkoxycarbonyl, alkenoxycarbonyl, alkoxycarbonylamino, alkoxycarbonylaminoalkyl, cycloalkyl having 3 to 6 ring members and 1 to 3 optional alkyl substituents, cycloalkenyl having 4 to 6 ring members and up to 3 optional alkyl substituents, cycloalkylalkyl having 3 to 6 ring members and up to 3 optional alkyl substituents, cycloalkenylalkyl having 4 to 6 ring members and up to 3 optional alkyl substituents with the additional proviso that each of the foregoing Ar-attached substituents has up to 8 carbon atoms, trifluoromethyl, nitro, amino, hydroxyl, halogen, aminocarbonyl, cyano, cyanoalkyl having from 2 to 4 carbon atoms, aminocarbonylalkyl having 2 to 4 carbon atoms,

n is the integer 0, 1, or 2 signifying the number of X groups, or

Ar-X_n as a unit refers to 4-indenyl, 6,7-dihydroxy-5,6,7,8-tetrahydro-1-napthyl, or 5-oxo-5,6,7,8-tetrahydro-1-naphthyl.

98. The method of inhibiting β-adrenergic activity in a mammalian host having a condition in which therapeutic benefit is derived from inhibition of the β-adrenergic receptors which comprises administering to said host a non-toxic effective adrenergic β-receptor inhibiting dose of a compound as claimed in claim 1.

99. The method of exerting a vasodilating effect in a mammalian host which comprises administering to a mammal having a condition in which therapeutic benefit is derived from vasodilatation, a non-toxic effective vasodilating dose of a compound as claimed in claim 1.

100. The antihypertensive method which comprises administering to a mammalian host having hypertension a non-toxic antihypertensive effective dose of a compound claimed in claim 1.

4,234,596

3-(2-AMINOETHYLTHIO)-6-(1-HYDROXYETHYL)-7-OXO-1-AZABICYCLO[3.2.0]HEPT-2-ENE-2-CARBOXYLIC ACID

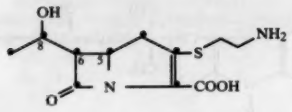
Burton G. Christensen, Scotch Plains; David B. R. Johnston, Warren, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 833,210, Sep. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 743,365, Nov. 19, 1976, abandoned, and Ser. No. 792,071, Apr. 28, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,680

Int. Cl.[2] C07D *487/04;* **A61K** *31/40*

U.S. Cl. 424—274 **12 Claims**

1. A compound having the structural formula:



which has the absolute configuration 5S,6S,8R and the pharmaceutically acceptable salts thereof.

7. An antibiotic pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,234,597

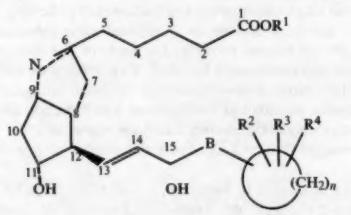
6,9-NITRILO(IMINO)-PROSTAGLANDIN ANALOGUES

Masaki Hayashi, Takatsuki; Shuichi Ohuchida, Kyoto, and Yoshinobu Arai, Toyonaka, all of Japan, assignors to Ono Pharmaceutical Co. Ltd., Osaka, Japan

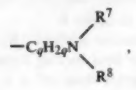
Filed Mar. 14, 1979, Ser. No. 20,339
Claims priority, application Japan, Mar. 18, 1978, 53-030531
Int. Cl.[3] A61K *31/40;* **C07D** *209/52*
U.S. Cl. 424—274 **20 Claims**

1. A prostaglandin I_2 analogue of the formula:

II



wherein R^1 represents a hydrogen atom, a straight- or branched-chain alkyl group of from 1 to 12 carbon atoms, a carbocyclic aralkyl group of from 7 to 12 carbon atoms, a cycloalkyl group of from 4 to 7 carbon atoms unsubstituted or substituted by at least one straight- or branched-chain alkyl group of from 1 to 4 carbon atoms, a phenyl group unsubstituted or substituted by chlorine, trifluoromethyl, straight- or branched-chain alkyl of from 1 to 4 carbon atoms, or phenyl, or represents a group $-C_pH_{2p}COOR^5$, $-C_qH_{2q}OR^6$ or



wherein R^5, R^7 and R^8, which may be the same or different, each represent a straight- or branched-chain alkyl group of from 1 to 4 carbon atoms, R^6 represents a hydrogen atom or a straight- or branched-chain alkyl group of from 1 to 4 carbon atoms, p represent an integer of from 1 to 12, and q represents an integer of from 2 to 12, R^2, R^3 and R^4, which may be the same or different, each represent a hydrogen atom or a straight- or branched-chain alkyl group of from 1 to 8 carbon atoms, B represents a single bond, or a straight- or branched-chain alkylene group of from 1 to 4 carbon atoms, n represents 3, 4, 5 or 6, the symbol== attached to the C_6 carbon atom represents a single or double bond, the double bond between C_{13}–C_{14} is trans, and the hydroxy groups attached to the C_{11} to C_{15} carbon atoms of formula II are in α-configuration, and non-toxic acid addition salts thereof and, when R^1 represents a hydrogen atom, non-toxic salts thereof.

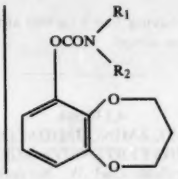
4,234,598

PHENYLCARBAMATES

Madhukar S. Chodnekar, Seltisberg; Peter Loeliger, Münchenstein; Ulrich Schwieter, Reinach; Albert Pfiffner, BUMLu/lach; Milos Suchy, Pfaffhausen, and Rene Zurflüh, Bülach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

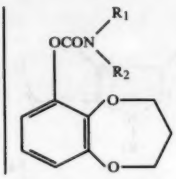
Continuation of Ser. No. 816,826, Jul. 18, 1977, abandoned. This application Apr. 11, 1979, Ser. No. 29,088
Int. Cl.[3] A01N *43/24;* **C07D** *319/08*
U.S. Cl. 424—278 **18 Claims**

1. A compound represented by the formula



wherein R_1 is lower alkyl, lower alkenyl, lower alkynyl, lower alkylcarbonyl, halogen-lower alkylcarbonyl or trichloromethylsulfenyl and R_2 is hydrogen or lower alkyl.

8. A pesticidal composition which comprises inert carrier material and, as the active ingredient, an amount, which is effective as a pesticide, of a compound of the formula



wherein R_1 is lower alkyl, lower alkenyl, lower alkynyl, lower alkylcarbonyl, halogen-lower alkylcarbonyl or trichloromethylsulfenyl and R_2 is hydrogen or lower alkyl and mixtures of these compounds.

15. A method for the control of pests which comprises appiying, to the site to be treated, an amount of the pesticidal composition of claim 8 which is effective in the control of pests.

4,234,599

TREATMENT OF SKIN KERATOSES WITH α-HYDROXY ACIDS AND RELATED COMPOUNDS

Eugene J. Van Scott, 1138 Sewell La., Rydal, Pa. 19046, and Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002

Filed Oct. 4, 1978, Ser. No. 948,489
The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.
Int. Cl.[3] A61K *31/335, 31/16*
U.S. Cl. 424—279 **25 Claims**

1. A method for alleviating the symptoms of actinic or nonactinic skin keratoses comprising topically applying to involved areas of the body an effective amount of a composition comprising:

a therapeutically effective amount of a member selected from the group consisting of α-hydroxybutyric acid, α-hydroxyisobutyric acid, α-hydroxyisocaproic acid, α-hydroxyisovaleric acid, atrolactic acid, β-hydroxybutyric acid, β-phenyl lactic acid, β-phenylpyruvic acid, citric acid, ethyl pyruvate, galacturonic acid, glucoheptonic acid, glucoheptono 1,4-lactone, gluconic acid, glucono-

lactone, glucuronic acid, glucuronolactone, glycolic acid, isopropyl pyruvate, mandelic acid, methyl pyruvate, mucic acid, pyruvic acid, saccharic acid, saccharic acid 1,4-lactone, tartaric acid and tartronic acid in a pharmaceutically acceptable vehicle.

2. The method of claim 1 wherein said composition further comprises a base selected from the group consisting of ammonium hydroxide, an organic primary, secondary, tertiary or quaternary alkylamine, alkanolamine, diamine, dialkylamine, dialkanolamine, alkylalkanolamine, trialkylamine, trialkanol amine, dialkyl alkanolamine, or alkyl dialkanolamine wherein the alkyl or alkanol substituent has from 1 to 8 carbon atoms present in an amount effective to establish a pH of said composition of between 3.0 and 7.5.

4,234,600
COMBATING ARTHROPODS WITH N-BENZOYL-N'-TERT.-ALKOXYCARBONYLPHENYL-(THIO) UREAS

Wilhelm Sirrenberg, Sprockhoevel; Ingeborg Hammann, Cologne; Wilhelm Stendel, Wuppertal, . nd Erich Klauke, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

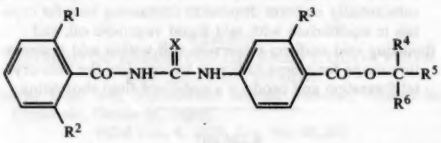
Filed Sep. 20, 1979, Ser. No. 77,435

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1978, 2843851

Int. Cl.[3] A61K *31/245;* **C07C** *101/42*

U.S. Cl. 424—310 **10 Claims**

1. An N-benzoyl-N'-tert.-alkoxycarbonylphenyl(thio) urea of the formula



in which

R^1 represents halogen or alkyl,

R^2 and R^3 independently of one another represent hydrogen or halogen,

R^4 represents alkyl,

R^5 and R^6 either individually represent alkyl or together represent α,ω-alkanediyl and

X represents oxygen or sulphur.

8. An arthropodicidal composition containing as active ingredient an arthropodicidally effective amount of a compound according to claim 1 in admixture with a diluent.

9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

4,234,601
ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

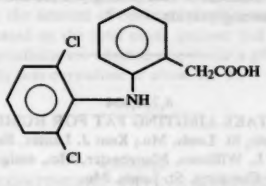
Filed Dec. 18, 1978, Ser. No. 970,513

Int. Cl.[2] A61K *31/19, 31/165, 31/195*

U.S. Cl. 424—319 **9 Claims**

1. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) as primary antinociceptive agent from about 0.08 to 0.47 mg/kg of body weight of a 2-[(2,6-dichlorophenyl-)amino]benzeneacetic acid compound, said compound selected from (a) 2-[(2,6-dichlorophenyl)amino]benzeneacetic acid having the formula



and (b) the non-toxic therapeutically acceptable salts thereof; and

(2) as potentiating agent, from about 1.8 to 7.5 mg/kg of body weight of acetaminophen.

4,234,602
NAPHTHALENONE DERIVATIVES AND ANALOGS

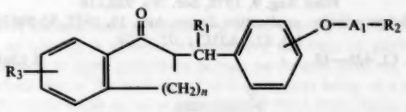
John Krapcho, and Joseph Schwartz, both of Somerset, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 873,644, Jan. 30, 1978, Pat. No. 4,179,558. This application Jul. 16, 1979, Ser. No. 57,914

Int. Cl.[3] A61K *31/40, 31/135, 31/205, 31/445*

U.S. Cl. 424—330 **10 Claims**

1. A method of treating inflammation in a mammalian species which comprises administering to a mammal in need thereof an effective amount of a compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, alkyl, phenyl or phenyl substituted with a halogen, alkyl, alkoxy or trifluoromethyl group; R_2 is alkylamino, dialkylamino, 1-piperidinyl, 1-pyrrolidinyl, 4-morpholinyl, 4-alkyl-1-piperidinyl or 4-(2-hydroxyethyl)-1-piperidinyl; R_3 is hydrogen, halogen, alkyl, alkoxy or trifluoromethyl; A_1 is a straight or a branched chain alkylene group having 2 to 5 carbon atoms; and n is 1, 2 or 3; wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms.

4,234,603
SKIN-TREATING COMPOSITION AND VEHICLE FOR SKIN-TREATING AGENTS

Gunnar P. E. Swanbeck, Vaxholm, Sweden, assignor to Medisan AB, Upsala, Sweden

Continuation of Ser. No. 712,066, Aug. 5, 1976, which is a continuation of Ser. No. 571,746, Apr. 25, 1975, abandoned, which is a continuation of Ser. No. 322,197, Jan. 9, 1973, abandoned. This application Feb. 28, 1978, Ser. No. 882,810

Claims priority, application United Kingdom, Jan. 10, 1972, 1073/72

Int. Cl.[2] A61K *7/48, 47/00*

U.S. Cl. 424—365 **9 Claims**

1. A composition for softening dry or rough skin which is capable of water retention by the corneous layer of the skin in contact therewith consisting essentially of:

(a) an aqueous solution of urea and a physiologically compatible salt selected from the group consisting of NaCl, $Na_2S_2O_3$, Na_2HPO_4, NaH_2PO_4 and $MgCl_2$, said solution having a pH of 2–8, the concentration of said urea and salt being 10–40% by weight of the aqueous solution, the weight ratio of urea to salt being within the range from 5:1 to 1:5, the rest being water and

(b) a dispersed liquid phase in an amount of from 5 to 50% by weight of the composition, said lipid phase consisting

essentially of an emulsifier selected from the group consisting of monolauric acid monoglyceride and monomyristic acid monoglyceride.

4,234,604

FEED INTAKE LIMITING FAT FOR RUMINANTS

Norman L. Betz, St. Louis, Mo.; Kent J. Lanter, Belleville, Ill., and Danny L. Williams, Manchester, Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Dec. 18, 1978, Ser. No. 970,020
Int. Cl.[3] A23K *1/00*
U.S. Cl. 426—2 25 Claims

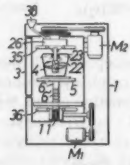
1. A feed intake limiting composition for ruminants to control consumption of a feed supplement when added thereto comprising a material selected from the group consisting of meat meal, diammonium phosphate, ammonium sulfate, and combinations thereof and an intake limiting ingredient comprising a chlorinated fat having a reacted chlorine content of between about 0.2 and 3.7% by weight of said fat.

4,234,605

METHOD OF MAKING BREAD IN AN OVEN USING A COMBINED TROUGH AND BAKING-PAN UNIT

Shigeo Takeuchi, 2-banchi, Kiba-cho, Minato-ku, Nagoya-shi, Aichi-ken, Japan

Filed Aug. 9, 1978, Ser. No. 933,116
Claims priority, application Japan, Aug. 19, 1977, 52-99833
Int. Cl.[3] A21C *1/02, 1/04*
U.S. Cl. 426—18 1 Claim



1. A method of making bread comprising the sequential steps of:

(a) throwing flour and other bread ingredients into a removably mounted combined trough and baking-pan unit in an oven while feeding water to a water tank in said oven;

(b) heating the water within said water tank to substantially the same temperature as that of the oven interior;

(c) adding the heated water to said flour and other bread ingredients in said combined trough and baking-pan unit;

(d) mechanically agitating and kneading the mixture of said flour, other bread ingredients and water in said combined trough and baking-pan unit to form dough while keeping said combined trough and baking-pan unit within said oven;

(e) primarily fermenting the dough in said combined trough and baking-pan unit;

(f) mechanically degassing the dough in said combined trough and baking-pan unit;

(g) secondarily fermenting the dough in said combined trough and baking-pan unit; and

(h) baking the dough in said combined trough and baking-pan unit in said oven into a loaf of bread;

wherein all of the steps (b) to (h) are carried out in situ continuously and mechanically under atmospheric pressure in one and the same combined trough and baking-pan unit without removing it out of said oven.

4,234,606

FLUID SHORTENING

Ilija Gawrilow, Strongsville, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 747,296, Dec. 3, 1976. This application Aug. 3, 1978, Ser. No. 930,746
Int. Cl.[3] A21D *2/16;* A23D *5/02*
U.S. Cl. 426—24 11 Claims

1. In a process for making yeast-raised bakery produces containing shortening, the improvement comprising adding to such products a fluid shortening prepared by the process comprising:

heating a mixture of soft or hard mono- and diglycerides, ethoxylated fatty acid ester emulsifier, solid beta-phase crystalline food emulsifier, and liquid vegetable oil to form a liquefied molten mixture, said mixture comprising by weight about 4 to about 10 weight parts of said soft or hard mono- and diglyceride, about 2 to about 8 weight parts of said ethoxylated fatty acid ester emulsifier, about 2 to about 8 weight parts of said solid beta-phase crystalline food emulsifier, and about 0 to about 3 weight parts solid stearine, the remainder being at least about 40 parts of said liquid vegetable oil;

said ethoxylated fatty acid ester emulsifier being an ethoxylated fatty acid ester of glycerol, polyglycerols propylene glycol, hexitol, hexitan and isohexide, or a fatty acid ester of ethoxylated glycerol, hexitol, hexitan and isohexide;

rapidly cooling said molten mixture to a temperature within the range of about 80° to 90° F. to initiate beta-crystal formation and produce a chilled blend having dispersed fat crystals;

working said chilled blend within said temperature range to further develop beta-crystal formation and produce a substantially uniform dispersion containing beta-fat crystals in equilibrium with said liquid vegetable oil; and

fluidizing said uniform dispersion still within said temperature range for a time sufficient to complete the beta-crystal formation and produce a stabilized fluid shortening.

4,234,607

PROCESS FOR PRODUCING CURED MEAT PRODUCTS

Shigenori Ohta, Komae, and Kenji Watanabe, Hino, both of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1979, Ser. No. 53,161
Claims priority, application Japan, Jun. 30, 1978, 53/78698
Int. Cl.[3] A23B *4/12;* A23L *1/272*
U.S. Cl. 426—56 9 Claims

1. A process for producing cured meat products, which process comprises treating a raw meat with a curing agent containing NO_2, and at least one member selected from ascorbic acid and alkali metal salts thereof in the presence of ascorbinase.

4,234,608

PROCESS OF MANUFACTURING FEED BLOCKS AND PRODUCTS THEREOF

Kevin L. Linehan, East Burwood, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Filed Oct. 16, 1978, Ser. No. 951,954
Claims priority, application Australia, Nov. 1, 1977, 2259/77
Int. Cl.[3] A23K *1/16, 1/175, 1/20*
U.S. Cl. 426—72 25 Claims

1. A process for the manufacture of a rigid alkaline, animal feed supplement block which process comprises the following steps in sequence:

(1) heating a water bearing medium chosen from the group consisting of water, aqueous whey, aqueous sorbitol, aqueous glucose, aqueous fructose, aqueous sucrose and molasses to a temperature in the range from 20° C. to 90° C.

(2) adding to said water bearing medium an amount of active

magnesium oxide in the range from 5% to 30% by weight of the total block ingredients and an amount of dicalcium phosphate in the range from 3 to 50% by weight of the total block ingredients and blending the mixture of the water bearing medium, magnesium oxide and dicalcium phosphate at a temperture not in excess of 90° C. for a sufficient length of time to obtain a substantially uniform reaction mixture;

(3) optionally blending into the mixture additional water or one or more liquid or solid animal medicaments or animal nutrients;

(4) transferring said reaction mixture to a mould; and

(5) reacting said mixture in the mould at a temperature in the range from 45° C. to 110° C. to give a substantially rigid alkaline block.

4,234,609

METHOD OF FORMING FOOD PRODUCT FROM MOLLUSKS AND PRODUCT THEREOF

Philip A. Witte, West Alton, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 840,925, Oct. 11, 1977, abandoned. This application Aug. 28, 1978, Ser. No. 937,618

Int. Cl.³ A23L *1/333*

U.S. Cl. 426—104 **17 Claims**

11. A method of making an imitation mollusk meat product comprising:

a. parboiling mollusk meat;

b. mixing said parboiled meat with from 5 to 80% by weight isolated soy protein fibers buffered to about neutral pH;

c. forming said mixture; and cooking said formed mixture to an internal temperature of between about 150° F. and 220° F.

4,234,610

METHOD OF REMOVING OFFENSIVE ODOR FROM THE MEAT OF SHARKS

Ichiro Ema, 6-6, Nipponbashi higashi 3-chome, Naniwa-ku, Osaka-shi, Osaka-fu, Japan

Filed Jun. 4, 1979, Ser. No. 45,263

Claims priority, application Japan, May 11, 1979, 54-59461

Int. Cl.³ A23L *3/26*

U.S. Cl. 426—248 **9 Claims**

1. A method of removing offensive odor from the meat of sharks, comprising the steps of cutting the meat of a shark into slices, wrapping each of the slices in a wrapping film, immersing said slices in a saline solution, allowing them to stand at temperatures, low enough to preserve the shark meat from decay, for several hours under exposure to scattered light produced by permitting light from an electric light source to pass through a synthetic resin sheet, discarding said saline solution, further allowing said slices to stand at a low temperature of about 5°–10° C. for at least 8 hours under exposure to said scattered light, removing said wrapping film from said slices, and washing said slices in clear water.

4,234,611

SOFT INTERMEDIATE-MOISTURE FROZEN PUDDINGS AND FILLINGS

Marvin L. Kahn, Williamsville, and Kuttikandathil E. Eapen, Kenmore, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Division of Ser. No. 917,379, Jun. 20, 1978, which is a division of Ser. No. 871,995, Jan. 24, 1978, Pat. No. 4,145,863, which is a division of Ser. No. 763,613, Jan. 28, 1977, Pat. No. 4,146,652. This application Mar. 26, 1979, Ser. No. 24,128

Int. Cl.³ A23L *1/187, 1/04*

U.S. Cl. 426—321 **21 Claims**

1. A microbiologically stable pudding or filling product comprising about from 25 to 55% water, sugar in a ratio to water of about from 2–0.8:1, about from 3 to 25% fat, and minor but effective amounts of gelling agent, emulsifier, stabilizer and flavoring, provided that the amount of fat is less than the amount of water, the solutes content is adequate to provide the product with a water activity of about from 0.8 to 0.9, and in said sugar the amount of dextrose plus fructose is at least about 50% based on the total sugar content, and wherein the foregoing ingredients are adapted to provide a product which is substantially non-crystalline at about 10° F.

4,234,612

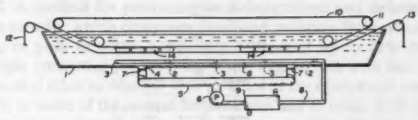
CONTINUOUS FRYING METHOD

Sakuichi Sakakibara, No. 1-8, 2-chome, Uozaki-kita-machi, Higashinada-ku, Kobe-shi, Hyogoken; Ko Sugisawa, No. 8-15, 2-chome, Chiyogaoka, Nara-shi, Nara-ken; Junji Majima, No. 12-21, Kita-Showa-cho, Nishinomiya-shi, Hyogo-ken, and Ryusuke Nakanaga, No. 7-22, Fujinosato-cho, Takatsuki-shi, Osaka-fu, all of Japan

Division of Ser. No. 844,585, Oct. 25, 1977, which is a continuation of Ser. No. 681,437, Apr. 29, 1976, abandoned. This application Nov. 24, 1978, Ser. No. 963,274

Int. Cl.³ A23L *1/16*

U.S. Cl. 426—394 **5 Claims**



1. A method using oil for drying water-bearing food consisting of noodles in strip form comprising the steps of: packing said food in open containers having perforated bottoms, the perforations in the bottoms of said containers being of a size sufficiently small so as to prevent said food from being displaced out of said containers and sufficiently large so as to enable oil to pass therethrough; providing a bath of said oil; sequentially conveying said packed containers through said oil bath in a predetermined path; applying over said containers a removable cover having perforations of about the same size as said container bottoms before conveying said containers through said bath; directing oil against said conveyed containers within said oil bath under a pressure sufficient to cause oil to enter said containers through said perforations and sufficient to urge apart parts of said food in said containers thereby to induce substantially all the surfaces of said food parts to be exposed to said oil; maintaining the temperature of the oil entering said containers at a level at least sufficient to convert water in said food to steam; maintaining contact between said food in said containers and said oil for a period sufficient to at least partly dehydrate said food; and separating the at least partly dehydrated food from said oil.

4,234,613

ROBUSTA COFFEE

Neal A. Lewis, Mason, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 30, 1976, Ser. No. 755,924

Int. Cl.³ A23F *5/16*

U.S. Cl. 426—430 **16 Claims**

1. A process for preparing an improved, substantially non-decaffeinated Robusta coffee comprising:

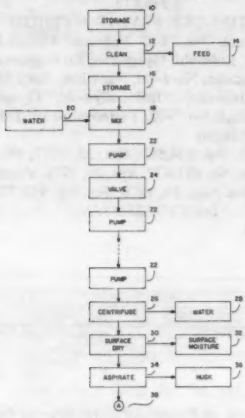
(1) contacting roast and ground Robusta coffee beans with a low molecular weight alcohol having from 1 to 3 carbon atoms, the weight ratio of beans:alcohol being in the range of from about 2:1 to about 1:5, for from about 1 minute to about 20 minutes; and

(2) removing the alcohol from contact with said coffee.

4,234,614
METHOD OF PROCESSING CORN

Edwin R. Hart, Allen, Tex., assignor to Seven-H Corporation, Richardson, Tex.

Division of Ser. No. 729,376, Oct. 4, 1976, Pat. No. 4,126,707. This application Nov. 20, 1978, Ser. No. 962,464
The portion of the term of this patent subsequent to Nov. 21, 1995, has been disclaimed.
Int. Cl.[3] A23L *1/10, 1/20*
U.S. Cl. 426—462 **7 Claims**



1. A method of processing corn to make masa comprising the steps of:

mixing water with the corn to form a slurry;

pumping the slurry successively through a plurality of pump stages, each stage having a turbine pump and a turbine pump impeller, in each turbine pump, raised to provide sufficient clearance so that the pump will pass the corn as a whole kernel and separate the husks from the kernels without cracking a substantial percentage of the kernels;

removing the water from the slurry;

surface drying the corn;

aspirating the corn to remove the husks from the kernels and;

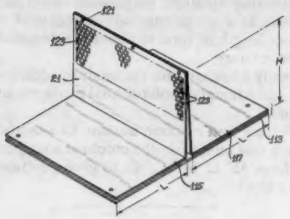
cooking the aspirated kernels.

4,234,615
METHOD FOR MAKING LARGE SIZED BLOCKS OF CHEESE

Grant E. Krueger, Green Bay, Wis., assignor to Kraft, Inc., Glenview, Ill.

Continuation of Ser. No. 705,104, Jul. 14, 1976, abandoned, which is a continuation of Ser. No. 388,101, Aug. 13, 1973, Pat. No. 3,969,952. This application Aug. 1, 1978, Ser. No. 930,055
The portion of the term of this patent subsequent to Jul. 20, 1993, has been disclaimed.
Int. Cl.[3] A23C *19/02*
U.S. Cl. 426—478 **9 Claims**

1. In a method for manufacturing a block of cheese of uniform texture and moisture distribution from curd in particulate form comprising the steps of filling the curd into a container, locating a perforated, V-shaped blade wholly in the curd, said V-shaped blade having two side walls diverging from the apex of the blade, opening the curd by means of the two diverging side walls of the blade, applying pressure to the curd while the blade is in the curd, draining the curd through the blade, and removing the blade to permit knitting of the curd to provide a cheese block of uniform texture and moisture, the improvement comprising: locating the apex of a V-shaped blade substantially along an axis of said container; providing at least 3 square inches of perforated area per linear inch of blade length; locating all of the perforated area of said V-shaped blade in the half of said blade closest to the apex thereof for whey drainage; and opening the curd by means of the two side walls of the



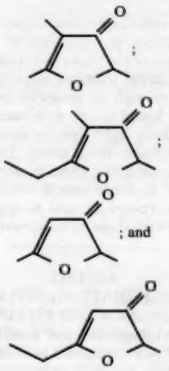
blade by a maximum distance of 4 inches and not less than a distance sufficient to accommodate the diverging side walls such that said walls are separated by a space only adequate to allow whey flow between said walls.

4,234,616
FLAVORING WITH MIXTURES OF 2,5-DIALKYL DIHYDROFURANONES AND 2,4,5-TRIALKYL DIHYDROFURANONES

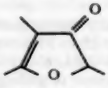
Chi-Kuen Shu, Cliffwood; Braja D. Mookherjee, Holmdel, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 928,606, Jul. 27, 1978, abandoned. This application Aug. 3, 1979, Ser. No. 63,561
Int. Cl.[3] A23L *1/226*
U.S. Cl. 426—536 **2 Claims**

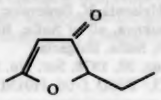
1. A process for augmenting or enhancing the taste or aroma of a caramel, butterscotch, rum, dairy,, vanilla or roasted almond-flavored foodstuff comprising the step of adding to said foodstuff from about 0.1 ppm up to about 50 ppm by weight of said foodstuff of a mixture of dialkyl and trialkyl dihydrofuranones having the structures:



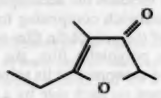
wherein the weight percentage ranges in said dihydrofuranones in said mixture is from about 10% up to about 40% by weight of the compound having the structure:



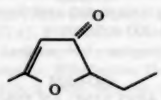
from about 5% up to about 20% of the compound having the structure:



from about 10% up to about 30% of the compound having the structure:



and from about 5% up to about 20% of the compound having the structure:



4,234,617

METHOD FOR PREPARING INSTANT COOKING NOODLES

Sakuichi Sakakibara, Kobe; Ko Sugisawa; Takashi Kimura, both of Nara; Teruo Yasukawa, Sakai, and Tamotsu Kamoda, Kishiwada, all of Japan, assignors to House Food Industrial Company, Limited, Osaka, Japan

Filed Apr. 13, 1979, Ser. No. 29,634
Claims priority, application Japan, May 23, 1977, 52 58719
Int. Cl.[3] A23L *1/16*
U.S. Cl. 426—557 **9 Claims**

1. A method for preparing instant cooking noodles, comprising the steps of

(a) mixing a cereal flour with about 1% to 10%, by weight, based on the weight of the cereal flour, of a hydrolyzate of a starch derived from a root or stalk of a plant having a D.E. of 1 to 10 and water to produce a dough mixture,
(b) kneading the mixture to form a dough,
(c) rolling the dough into a sheet having a thickness of less that 2 millimeters.
(d) cutting the rolled sheet into strips,
(e) steaming the cut strips, and
(f) drying the steamed strips at a temperature of about 80° C. to 130° C.

4,234,618

LIPOIDAL COMPOSITIONS, HARD BUTTER COMPONENTS, AND IMPROVEMENT IN PROCESS FOR MAKING THE LATTER

James J. Jasko, and Richard J. Zielinski, both of Middleburg Heights, Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,639
Int. Cl.[3] A23D *5/00*; C11C *3/12*; A23G *1/00*
U.S. Cl. 426—607 **7 Claims**

1. A composition comprising:

about 15–40 parts cocoa butter;
about 0–25 parts butterfat,
the sum of the parts of said cocoa butter and of said butterfat being not in excess of about 40; and
about 60–85 parts of confectioner's hard butter having the following characteristics;
at least about 96% C_{16-18} triglycerides with about 40–50% by weight of the total combined acids being unsaturated acids in the trans configuration, a substantial proportion of the remaining acids being also unsaturated and in the cis configuration,
an SFI profile of 78–85% at 50° F. and at 70° F., 70–80% at 80° F., 31–45% at 92° F., a maximum of 3% at 100° F., and zero at 110° F.; and
a Mettler Dropping Point between about 36° and about 39° C.

4,234,619

DECHOLESTEROLIZED AND DEFATTED EGG POWDER AND METHOD FOR PRODUCING SAME

Nobumitsu Yano; Itaru Fukinbara, both of Tokyo; Koji Yoshida, and Yutaka Wakiyama, both of Kamikohashi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 3, 1978, Ser. No. 957,594
Claims priority, application Japan, Nov. 16, 1977, 52/136678
Int. Cl.[3] A23L *1/28, 1/32*
U.S. Cl. 426—614 **4 Claims**

2. A method for producing decholesterolized and defatted egg powder which comprises removing moisture from whole egg or yolk to obtain a moisture content of up to 25% by weight contacting the resulting whole egg or yolk with liquid dimethyl ether to remove 95% or more of the cholesterol and 95% or more of the neutral fat therefrom and to retain 30% or more of the phospholipids, and removing the dimethyl ether.

4,234,620

WATER-SOLUBLE VEGETABLE PROTEIN AGGREGATES

Paulette A. Howard; Michael F. Campbell, and David T. Zollinger, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Dec. 26, 1978, Ser. No. 973,195
Int. Cl.[3] A23J *3/00*
U.S. Cl. 426—656 **25 Claims**

1. A process for improving the water-solubility of a vegetable protein product, said process comprising the steps of:

(A) supplying an aqueous vegetable seed feedstream to a homogenizer with said feed stream containing on a dry solids basis at least 30% by weight vegetable seed protein and a sufficient amount of base to maintain the feed stream within said homogenizer at a pH between about 6.5 to 9.0;
(B) increasing the water-solubility of the vegetable seed protein by subjecting the aqueous feed stream in the homogenizer to successive pressure and cavitation cycling at a temperature between about 50° C. to about 150° C.; and
(C) recovering the vegetable protein product having an improved water-solubility therefrom.

4,234,621

MEANS AND METHOD OF RESTORING DOCUMENTS, PAINTINGS AND THE LIKE

Robert E. Fieux, 263 Cedar St., West Barnstable, Mass. 02668

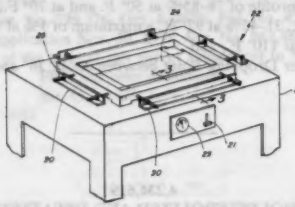
Division of Ser. No. 856,772, Dec. 2, 1977, Pat. No. 4,156,399. This application Jan. 8, 1979, Ser. No. 1,481
Int. Cl.[3] B05D *1/02*; B32B *35/00*
U.S. Cl. 427—13 **8 Claims**

1. A method of restoring paintings, documents and the like comprising the steps of;

providing a strainer means,

securing the painting in the strainer means,

heating the painting so as to make the painting more supple,



and applying lateral tension by operation of the strainer means in the plane of the painting to correct surface irregularities.

4,234,622

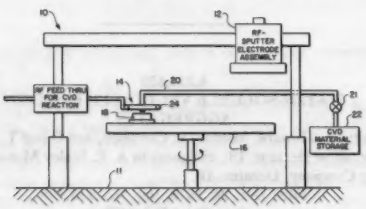
VACUUM DEPOSITION METHOD

Stanley DuBuske, Lincroft; Willis M. Smith, Fair Haven; Edward Daly, Keyport, all of N.J.; Albert F. Newman, Sun City, Ariz.; Louis E. Branovich, Howell, and Adolph G. Hager, Pt. Pleasant, both of N.J., assignors to The United States of American as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 11, 1979, Ser. No. 28,935

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—45.1 **18 Claims**



1. Method of vacuum depositing more than one metallic coating onto a substrate using different film deposition methods in a single vacuum deposition chamber without breaking vacuum between depositions, said method including the steps of:

(a) providing a vacuum deposition chamber with an RF sputter electrode, a chemical vapor deposition assembly spaced from said sputter electrode, and a substrate that can be rotated from beneath the RF sputter electrode to beneath the chemical vapor deposition assembly, wherein said chemical vapor deposition assembly includes a delivery tube for delivering material for chemical vapor deposition to the substrate, a source of material for said chemical vapor deposition located externally to said vacuum deposition chamber and connecting with an end of said delivery tube, and an RF coil positioned around the other end of the delivery tube to heat the substrate to the chemical vapor deposition reaction temperature,

(b) cleaning and degassing the substrate under vacuum in the deposition chamber,

(c) positioning the substrate below the RF sputter electrode, backfilling the chamber with argon, and then sputter depositing a primary metal coating onto the substrate, and

(d) rotating the coated substrate to beneath the chemical vapor deposition assembly, vacuum pumping the chamber to 10^{-7} torr, delivering the material to be chemically vapor deposited to the substrate surface, and heating the substrate to the temperature required for the chemical vapor deposition reaction to take place.

4,234,623

METHOD FOR THE PRODUCTION OF MEMBRANE BATTERY SEPARATORS

Rafail V. Moshtev; Hrisanta N. Budevska; Latinka T. Ivanova, and Radka D. Yankova, all of Sofia, Bulgaria, assignors to ZLEHIT pri BAN, Sofia, Bulgaria

Filed Aug. 30, 1978, Ser. No. 937,998

Int. Cl.³ B05D *3/06*; H01M *2/16*

U.S. Cl. 427—54.1 **9 Claims**

1. In a method for the production of a battery separator film made of a polyolefin film which has been irradiated by ultraviolet rays to which a vinyl monomer has been grafted, the improvement which includes the accomplishment of the grafting in a five-layer sandwich comprising forming a three-layer sandwich made up of the polyolefin film and a cellulose tissue on each side of the polyolefin film, the tissue layers being impregnated with the monomer or its solution, the three-layer sandwich being pressed on each side by a polymer foil which confines the reaction space, said polymer foil being inert, contacting the resulting five-layer sandwich for 10 to 45 minutes against a heater with a pressure of 10 to 30 g/cm², the layers of the five-layer sandwhich being of unlimited length, the five-layer sandwich being transported over the surface of the heater at a speed of from 1–100 m/hour.

4,234,624

METHOD OF APPLYING AN INSULATION OF CROSS-LINKED POLYMER ON A CABLE CONDUCTOR

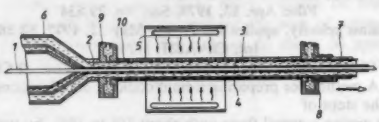
Gustaf Linderoth, Bromma, and Karl-Gunnar Wiberg, Stockholm, both of Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Mar. 1, 1979, Ser. No. 16,505

Claims priority, application Sweden, Mar. 7, 1978, 7802547

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—55 **6 Claims**



1. In a method of applying an insulation of cross-linked polymer onto a cable conductor in which a cross-linkable polymer is extruded around the cable conductor and thereafter cross-linked by the simultaneous application of heat and pressure in a vulcanization tube, the improvements of heating the cross-linkable polymer by use of radiation energy having at least its main portion with wavelengths of between 0.76 and 4 microns, locating the radiation energy generating means outside of the vulcanization tube, and utilizing a vulcanization tube which is pervious to the said radiation energy so as to allow its passage therethrough.

4,234,625

PROCESS FOR PRODUCING MATERIAL SENSITIVE TO ELECTROMAGNETIC AND CORPUSCULAR RADIATION

Vyacheslav V. Petrov, prospekt Vernadskogo, 85, kv. 55, and Andrei A. Krjuchin, ulitsa Studencheskaya, 12/14, kv. 43, both of Kiev, U.S.S.R.

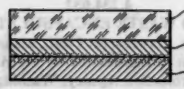
Filed Jan. 19, 1978, Ser. No. 870,835

Int. Cl.² G03C *5/00*

U.S. Cl. 427—74 **4 Claims**

1. A process of producing a material sensitive to electromagnetic and corpuscular radiation comprising the following steps: depositing, onto a transparent substrate, a layer of a semiconductive material; depositing, unto said layer of the semiconductive material, a barrier layer inert to the layer of the semiconductive material; depositing, unto said barrier layer, a layer of a metal capable of chemically reacting with said semicon-

ductive layer under the effect of said electromagnetic and corpuscular radiation with formation of reaction products having physical and chemical properties different from those of said metal layer and semiconductive layer; annealing of the resulting laminated structure at a temperature at least equal to



the temperature of diffusion of the material of said barrier layer into the material of at least one of said layers adjacent thereto, said annealing step being conducted for a period of time sufficient for at least partial dissolution of said barrier layer and prior to the exposure of the material to radiation.

4,234,626

PRODUCING PRINTED CIRCUITS BY CONJOINING METAL POWDER IMAGES

Robert W. Peiffer, Jackson, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 1, 1978, Ser. No. 874,353
Int. Cl.[3] H01K *1/00*
U.S. Cl. 427—97 **24 Claims**

1. In a process for producing a printed circuit containing an electrically conductive circuit trace from an electrically insulating material having adherent and non-adherent surface areas which comprises applying finely divided ductile metal or alloy particles to the surface areas; removing any excess metal or alloy particles from the non-adherent areas; the improvement comprising applying limited shear or pressure to the adherent ductile metal particles by which the particles are conjoined without damaging the metallized areas to form an electrically conductive circuit.

4,234,627

FABRIC CONDITIONING COMPOSITIONS

Kenneth J. Schilling, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 636,382, Nov. 28, 1975, abandoned. This application Feb. 4, 1977, Ser. No. 765,510
Int. Cl.[2] B05D *3/12*; D06M *13/16*
U.S. Cl. 427—242 **13 Claims**

1. A granular laundry presoaking/washing composition comprising:

(A) from about 3% to 20% by weight of a granular fabric treatment mixture, the granules within said mixture comprising

(i) water-insoluble, friable microcapsules varying in size from about 5 to 500 microns, each microcapsule consisting essentially of

(a) a liquid core containing fabric conditioning agent; and

(b) a solid thin polymeric shell completely surrounding said core; said shell having an average thickness ranging between about 0.1 and 50 microns; and

(ii) a substantially water-insoluble, fabric substantive capsule transfer agent having a melting point between about 40° C. and 150° C.; said capsule transfer agent surrounding each microcapsule;

the weight ratio of microcapsules to capsule transfer agent within each granule of the fabric treatment mixture between about 0.002:1 and 2000:1; and

(B) from about 5% to 90% by weight of a presoaking/washing adjuvant selected from the group consisting of water-soluble detersive surfactants, detergency builders and mixtures of water-soluble detersive surfactants and detergency builders.

10. A process for conditioning fabrics comprising the steps of:

(A) contacting said fabrics in an aqueous bath with an effective amount of a composition comprising:

1. from about 3% to 20% by weight of a granular fabric treatment mixture, the granules within said mixture comprising

(i) water-insoluble; friable microcapsules varying in size from about 5 to 500 microns, each microcapsule consisting essentially of

(a) a liquid core containing fabric conditioning agent; and

(b) a solid thin polymeric shell completely surrounding said core; said shell having an average thickness ranging between about 0.1 and 50 microns; and

(ii) a substantially water-insoluble, fabric substantive capsule transfer agent having a melting point between about 40° C. and 150° C.; said capsule transfer agent surrounding each microcapsule;

the weight ratio of microcapsules to capsule transfer agent within each granule of the fabric treatment mixture ranging between about 0.002:1 and 2000:1; and

2. from about 5% to 90% by weight of a presoaking-/washing adjuvant selected from the group consisting of water-soluble detersive surfactants, detergency builders and mixtures of water-soluble detersive surfactants and detergency builders; and

(B) manipulating said fabrics in an automatic clothes dryer at a temperature of from about 38° C. to about 100° C.

4,234,628

TWO-STEP PREPLATE SYSTEM FOR POLYMERIC SURFACES

Arthur H. DuRose, Pinellas Park, Fla., assignor to The Harshaw Chemical Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 687,261, May 14, 1976. This application Nov. 28, 1978, Ser. No. 964,306
Int. Cl.[2] B05D *3/04*; C23C *3/02*
U.S. Cl. 427—305 **8 Claims**

1. A process of preparing a non-metallic surface for the electroless deposition of a metallic layer of copper, nickel or gold comprising the steps of

(a) contacting the surface with a copper compound available from a bath selected from the group consisting of

(1) a solution of a simple cupric compound;

(2) a basic cupric hydrate suspension or colloid prepared by adding an alkali to the solution of (1);

(3) a clear cuprate solution; and

(4) a complex solution of copper containing a suitable complexing agent;

(b) thereafter contacting the surface with an accelerator selected from the group consisting of

(1) a nickel salt; and

(2) a cobalt salt

avsilable as a simple solution, suspension or a complex solution;

(c) rinsing the surface; and

(d) contacting the surface with a reducing agent selected from the group consisting of a borohydride, hydrazine and a borane.

4,234,629

METHOD FOR IMPROVING THE REMOVAL OF OIL FROM SURFACES

Paul E. Titus, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 796,271, May 12, 1977, Pat. No. 4,160,063, which is a division of Ser. No. 614,093, Sep. 17, 1975, Pat. No. 4,039,717, which is a division of Ser. No. 416,712, Nov. 16, 1973, now Re. 28,257. This application Apr. 2, 1979, Ser. No. 26,627

Int. Cl.[3] B05D *3/02*

U.S. Cl. 427—388.2 34 Claims

1. A method for facilitating the removal of residual oil from contacting surfaces comprising coating the surfaces with a film of polyacrylamide cross-linked in the presence of water with a salt of a polyvalent metal, contacting the surfaces with oil, and removing the oil from the surfaces.

18. A method for facilitating the removal of residual oil from contacting surfaces comprising coating the surfaces with a film of carboxymethylcellulose cross-linked in the presence of water with a salt of a polyvalent metal, contacting the surfaces with oil, and removing the oil from the surfaces.

4,234,630

PROCESS FOR THE PROTECTION OF CARBON BODIES

Josef Dietl, Munich, and Michael Wohlschläger, Unterpfaffenhofen, both of Fed. Rep. of Germany, assignors to Consortium für Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 65,818

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1978, 2845459

Int. Cl.[2] A23L *1/28*

U.S. Cl. 427—431 5 Claims

1. In a process for protecting carbon bodies against attack by molten silicon comprising the step of:

applying to the surface of the carbon body to be protected a separating protective layer comprising alkaline earth metal fluorides in admixture with 0 to 90 mole % of alkaline earth metal silicates have a melting point lower than that of silicon, said layer being applied in a manner which results in the wetting of the surface of said carbon body.

4,234,631

METHOD FOR IMMERSION DEPOSITION OF TIN AND TIN-LEAD ALLOYS

Thomas F. Davis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 857,069, Dec. 5, 1977, Pat. No. 4,194,913, which is a continuation-in-part of Ser. No. 574,979, May 6, 1975, Pat. No. 4,093,466. This application Jul. 20, 1979, Ser. No. 59,767

Int. Cl.[3] C23C *3/02*

U.S. Cl. 427—436 13 Claims

1. A method for the immersion deposition of essentially tin and tin-lead alloys onto copper or copper alloy substrates, comprising immersing said copper or copper alloy substrate into an immersion plating bath which comprises:

(a) a soluble plumbous salt in an amount from about 0.5 grams to about 25 grams per liter calculated on the basis of elemental lead including the maximum soluble in said bath;

(b) tin as a soluble stannous salt in an amount of from about 5 to 150 grams per liter;

(c) a thiourea as a sulfur containing complexing agent in an amount of from about 40 grams per liter to about 150 grams per liter; and

(d) sufficient hydrochloric acid or hydrobromic acid to provide a pH for the bath in the range of 0.6 to 1.0;

permitting said immersion plating to proceed at a temperature of about 100° F. to 200° F. for a sufficient time to build upon said substrate a tightly adherent layer of essentially tin or tin-lead alloy; wherein, in said deposition of essentially tin, said plumbous salt is present in sufficient amount to act as a rate of deposition enhancer, and wherein said bath will function to deposit said essentially tin and tin-lead alloys onto said copper or copper alloy substrates by immersion deposition at a rate of at least 85 microinches in 5 minutes at a temperature of 170° F.

4,234,632

SOLID WASTE ENCAPSULATION

Hyman R. Lubowitz, Hawthorne, Calif., assignor to The United States of America as represented by the Administrator U.S. Environmental Protection Agency, Washington, D.C.

Continuation of Ser. No. 812,535, Jul. 5, 1977, abandoned, which is a continuation of Ser. No. 626,507, Oct. 28, 1975, abandoned. This application May 26, 1978, Ser. No. 909,892

Int. Cl.[3] B65D *71/00*

U.S. Cl. 428—2 8 Claims

6. A process for isolating soluble solid waste from ecological forces such as water, pressure of overlying materials, and the like, comprising:

(A) mixing solid particulate waste selected from the group consisting of compounds of lead, chromium, cadmium, copper, zinc, calcium, iron, mercury, fluoride, and sulfate-sulfite, with about 1 to 10 percent by weight thermosetting resin in a solvent solution, and permitting the solvent to evaporate thereby forming a free-flowing powder;

(B) placing the free-flowing powder in a mold and curing the powder by application of heat and pressure thereto, thereby forming a hard, filled resin, compacted aggregate;

(C) completely coating said compacted aggregate with a tough, flexible, liquid impervious thermo-plastic resin layer about at least ¼" thick;

(D) whereby the aggregate is encapsulated in a liquid impervious casing.

8. The product produced by the process of either claim 6 or 7.

4,234,633

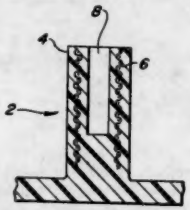
REINFORCED STUD SUPPORTS IN FIBERGLASS PARTS

Michael Gowetski, Muncie, and Robert W. Smith, Marion, both of Ind., assignors to The General Tire & Rubber Co., Akron, Ohio

Continuation of Ser. No. 850,758, Nov. 11, 1977, abandoned, which is a division of Ser. No. 713,757, Aug. 12, 1976, Pat. No. 4,088,525. This application Apr. 23, 1979, Ser. No. 32,048

Int. Cl.[3] B32B *3/26, 3/30*

U.S. Cl. 428—36 1 Claim



1. In a glass fiber filled plastic vehicle body part, made from sheet molding compound containing from 22% to 35% of glass fibers having a length of from 12 to 50 millimeters, having a plurality of stud supports, the improvement characterized by each of the plurality of stud supports containing:

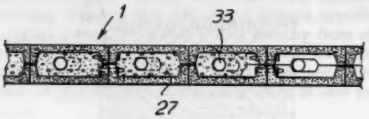
one non-woven continuous filament glass fiber cylinder embedded in each of the stud supports and completely surrounded by the sheet molding compound whereby each of the stud supports is reinforced to withstand the stress of the insertion of a self-threading stud.

4,234,634

PREFABRICATION SYSTEM FOR BUILDING WALLS

Enrico Longinotti, Via Timoteo Bertelli 2, Florence, Italy

Filed Aug. 23, 1978, Ser. No. 935,951
Claims priority, application Italy, Aug. 23, 1977, 9555 A/77
Int. Cl.[2] B32B 3/30
U.S. Cl. 428—58 13 Claims



1. A prefabricated construction for building walls, comprising: a pair of substantially flat, rectangular, cement wall elements; a plurality of integral, spaced, transverse, stiffening rib portions extending from one surface of each of said elements; a plurality of integral, spaced, longitudinal stiffening rib portions intersecting said transverse stiffening rib portions and extending from the same surface of each of said elements, at least some of said transverse rib portions on at least one of said wall elements including recesses on edges thereof away from said one surface, at least one of said recesses in one of said transverse rib portions being aligned with one of said recesses in each of a plurality of said transverse rib portions, and the depth of said recesses being less than the height of the respective transverse rear portions, said wall elements facing and spaced from each other with said stiffening rib portions of one wall element facing said stiffening rib portions of the other of said wall elements, and at least some of said stiffening rib portions of one wall element aligned with at least some of said stiffening rib portions of the other of said wall elements; and expanded synthetic material substantially filling the space between the said wall elements with at leaast one conduit passage defined in said expanded synthetic material adjacent at least some of said aligned recess of said transverse rib portions.

4,234,635

METHOD OF RIGIDIFYING THE TEARING EDGE OF A CARTON

William G. Atkinson, London, Canada, assignor to Somerville Belkin Industries Limited, London, Canada

Filed May 29, 1979, Ser. No. 42,992
Int. Cl.[3] B05D 5/00; B32B 23/02, 9/06, 29/00
U.S. Cl. 428—80 5 Claims

1. A method of forming a rigidified tearing edge at a first edge of a paperboard blank, said blank having a serrated marginal edge portion extending inwardly from said first edge, comprising the steps of,

(a) arranging a plurality of paperboard blanks in a stack with said first edges thereof disposed in a common plane,

(b) applying a clamping force to said stack of blanks to press at least said marginal edge portions towards one another to an extent sufficient to substantially prevent the ingress of hardening fluid therebetween and thereby prevent adhesion between the marginal edges of the sheets,

(c) applying to said first edges of the stack of blanks a coating liquid of a type which is at least semi-rigid when set,

(d) setting said coating to form a rigidifying coating at said first edge and thereby provide a rigidified tearing edge,

(e) releasing the clamping force to permit separation of the blanks from the stack.

5. A carton blank having a reinforced edged formed in accordance with the method of claim 1.

4,234,636

THERMOPLASTIC ELASTOMERIC COMPOSITION, PRODUCT AND METHOD OF MANUFACTURE

Agmund K. Thorsrud, Bath, and Roy W. Siedenstrang, Akron, both of Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 28, 1978, Ser. No. 973,978
Int. Cl.[3] B32B 7/10, 25/04, 27/04
U.S. Cl. 428—95 56 Claims

1. An unvulcanized, pressure and heat moldable composition comprising:

100 parts by weight of a thermoplastic elastomer;

at least about 10 parts by weight of an extender oil per 100 parts by weight of said thermoplastic elastomer; and

at least about 20 parts by weight of at least one solid, hygroscopic filler, having greater than 1 percent by weight of absorbed water and being capable of retaining a substantial portion of said absorbed water at a temperature above 100° C. and utilized in the preparation of said composition, per 100 parts by weight of said thermoplastic elastomer;

the ratio of said extender oil to said hygroscopic filler being from about 0.3 to about 3.

37. A flexible, molded thermoplastic elastomer article comprising:

100 parts by weight of a thermoplastic elastomer;

at least about 10 parts by weight of an extended oil per 100 parts by weight of said thermoplastic elastomer;

and at least 20 parts by weight of at least one solid, hygroscopic filler, having greater than 1 percent by weight of absorbed water and being capable of retaining a substantial portion of said absorbed water at a temperature above 100° C. and utilized in the preparation of said article prior the molding thereof, per 100 parts by weight of said thermoplastic elastomer;

the ratio of said extender oil to said hygroscopic filler being about 0.3 to about 3.

4,234,637

MICROPOROUS PROTECTIVE COVERINGS

Richard B. H. Sewell, and Derek J. Kidd, both of Victoria, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jun. 20, 1979, Ser. No. 50,297
Claims priority, application Canada, Jun. 22, 1978, 306049
Int. Cl.[3] B32B 3/26
U.S. Cl. 428—131 2 Claims

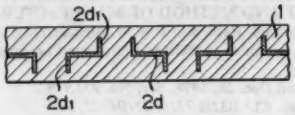
1. A flexible, microporous non-water-soluble, non-skin-toxic film of a material selected from the group consisting of natural and synthetic elastomers and synthetic polymers for use in protective garments, said film having first and second surfaces, a thickness between said surfaces being in the range of about 12.5μ to 12 mm, and between about 100 to 1000 pores per cm^2 of film surface, said pores extending between said surfaces and having a diameter in the range of about 2 to 100μ, wherein the pores are tapered and have an average diameter at the first surface of the film of about 2μ and an average diameter at the second surface of the film in the range of about 30 to 100μ.

4,234,638

COMPOSITE GRAPHITE SHEETS

Hiroshi Yamazoe, and Isao Sugiura, both of Yokohama, Japan, assignors to Nippon Carbon Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1977, Ser. No. 817,319
Claims priority, application Japan, Jul. 23, 1976, 51-87853
Int. Cl.[3] B32B 3/10, 3/24; B29J 1/00
U.S. Cl. 428—133 17 Claims



1. A composite sheet for gaskets, prepared by the steps of mixing expanded graphite having a c direction expansion of 10–300 times the c direction dimension of the original graphite particles with an inorganic binder selected from the group consisting of $Al_2O_3.3P_2O_5.6H_2O$, and $Al_2O_3.0.25Cr_2O_3.3P_2O_5.nH_2O$, each in an amount of 0.1 to 30 wt.%, inserting a hooked metallic sheet into said mixture as a core, said metallic sheet having a plurality of protrusions extending from the general plane of the metallic sheet, and compression molding the mixture at a pressure of 50–200 kg/cm^2 and a temperature of at least 500° C. to form a composite gasket sheet in which the metallic sheet is embedded within the gasket sheet and secured by said protrusions.

8. A composite sheet for gaskets, prepared by the steps of mixing expanded graphite having a c direction expansion of 10–300 times the c direction dimension of the original graphite particles with oxidized graphite as a binder in an amount of 3–40 wt.%, inserting a hooked metallic sheet into said mixture as a core, said metallic sheet having a plurality of protrusions extending from the general plane of the metallic sheet, and compression molding the mixture at a pressure of 50–200 kg/cm^2 and a temperature of at least 500° C. to form a composite gasket sheet in which the metallic sheet is embedded within the gasket sheet and secured by said protrusions.

15. A method of making a composite gasket sheet comprising the steps of mixing expanded graphite having a c direction expansion of 10–300 times the c direction dimension of the original graphite particles with oxidized graphite as a binder in an amount of 3 to 40 wt.%, inserting a hooked metallic sheet into said mixture as a core, said metallic sheet having a plurality of protrusions extending from the general plane of the metallic sheet, and compression molding the mixture at a pressure of 500–200 kg/cm^2 and a temperature of at least 500° C. to form a composite gasket sheet in which the metallic sheet is embedded within the gasket sheet and secured by said protrusions.

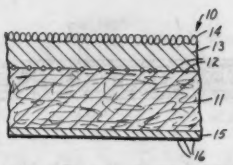
16. A method of making a composite gasket sheet comprising the steps of mixing expanded graphite having a c direction expansion of 10–300 times the c direction dimension of the original graphite particles with an inorganic binder selected from the group consisting of $Al_2O_3.3P_2O_5.6H_2O$ and $Al_2O_3.0.25Cr_2O_3.3P_2O_5.nH_2O$, each in an amount of 0.1 to 30 wt.%, inserting a hooked metallic sheet into said mixture as a core, said metallic sheet having a plurality of protrusions extending from the general plane of the metallic sheet, and compression molding the mixture at pressure of 50–200 kg/cm^2 and a temperture of at least 500° C. to form a composite gasket sheet in which the metallic sheet is embedded within the gasket sheet and secured by said protrusions.

4,234,639

INTUMESCABLE FIRE-RETARDANT PRODUCTS

Joseph Graham, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 23, 1979, Ser. No. 59,614
Int. Cl.[2] B32B 11/02, 5/30
U.S. Cl. 428—144 13 Claims



1. Fire-retardant granules comprising (1) core particles that comprise hydrated soluble silicate glass that intumesces in the presence of heat, and (2) a coating on the core particles comprising a mixture of (a) halogenated organic compound that releases halogen when heated to a temperature less than about 250° C.; and (b) an iron-containing compound adapted to react with said released halogen to form iron halide, whereby when said granules are mixed into asphalt and the asphalt exposed to a flame, charring of an exterior layer of the asphalt is catalyzed to limit flaming and flow of the asphalt.

9. Roofing material comprising in parallel layers, a roofing felt; at least one asphalt coating disposed above the felt; a layer of roofing granules partially embedded in the top asphalt coating in the roofing material; and a layer of the catalytic intumescable granules of claim 1 disposed within the roofing material.

10. Sheet material useful as an expansible fire barrier comprising a binder material that softens in the presence of heat and the granules of claim 1 dispersed in the binder material.

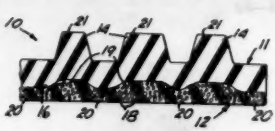
13. Polyurethane-based foam in which granules of claim 1 are dispersed.

4,234,640

CUSHIONED PRINTING LAMINATE

Frederick H. Wittel, P.O. Box 2501, Gainesville, Ga. 30501

Continuation of Ser. No. 664,954, Mar. 8, 1976, abandoned, which is a division of Ser. No. 343,461, Mar. 21, 1973, abandoned. This application Jul. 13, 1978, Ser. No. 924,186
Int. Cl.[3] B41N 1/00; B32B 3/30
U.S. Cl. 428—159 12 Claims



AFTER CURE

1. A printing laminate comprising:

a vulcanized rubber compound printing layer having a front side and a back side, and including raised printing elements formed on the front side thereof and lowered nonprinting areas formed on the front side thereof between said raised printing elements, each of said printing elements defining a printing face thereof; and

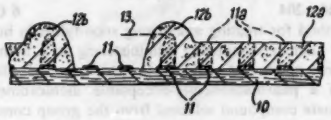
a cushion coextensive with and vulcanized to the back side of said printing layer including a foamed cushion layer of vulcanized rubber compound having voids uniformly distributed throughout, said voids constituting at least about one-half of the volume of said foamed cushion layer, said cushion layer including first portions underlying said raised printing elements of said printing layer having a first prescribed thickness to effectively cushion said printing elements during printing and second portions underly-

ing said non-printing areas of said printing layer having a second prescribed thickness less than said first prescribed thickness of said first portions under said raised printing elements of said printing layer, said second prescribed thickness being no greater than about two-thirds said first prescribed thickness to maintain the lateral stability of said printing elements on the printing laminate while said first portions of said cushion layer effectively cushion said printing elements, that side of said cushion opposite said printing generally parallel to said printing faces on said printing elements and said first portions extending up behind said printing elements beyond the plane of the back side of said lowered non-printing areas of said printing layer.

4,234,641
FOAM PLASTICS SHEET MATERIALS

David R. Thompson, Preston, and John P. Tomlinson, Darwen, both of England, assignors to Reed International Limited, England

Filed Jul. 10, 1979, Ser. No. 56,323
Int. Cl.[2] B32B 5/20
U.S. Cl. 428—159 **11 Claims**

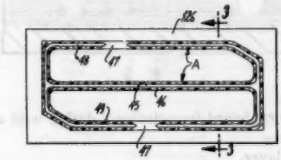


1. Foam plastics sheet material having a decorative finish comprising a substrate web having thereon a base coat and a foam coat in which the base coat comprises an organic pigment and some of the pigment has migrated through the foam coat to the surface of the foam coat so that the overall surface of the material exposes at least two different colourations.

4,234,642
MOLDED PLASTIC STRUCTURAL WEB ARTICLES

Olagoke Olabisi, Plainfield, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 936,056, Aug. 23, 1978, which is a continuation of Ser. No. 705,101, Jul. 14, 1976, Pat. No. 4,136,220. This application Dec. 8, 1978, Ser. No. 968,027
The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.
Int. Cl.[2] B32B 3/30; B29H 7/02
U.S. Cl. 428—188 **2 Claims**



1. In a structural web article of thermoplastic material having a substantially continuous enveloping skin around the exterior of said article, at least one generally continuous, hollow center therein, at least one integral skin-connecting web positioned in said hollow center and at least one entry passage from the exterior to the hollow center(s) of said article through said enveloping skin, the improvement which comprises an article having at least two tubular channels each having hollow center(s) passing therethrough, said center(s) each originating at said entry passage and terminating at said web, the length of said tubular channels being at least ten times its width and depth dimensions.

4,234,643
TENNIS BALL MARKING DECALCOMANIA

Alan C. Grotefend, Glen Ellyn, Ill., and Stephen F. Thon, Jim Falls, Wis., assignors to The Meyercord Co., Carol Stream, Ill.

Filed May 30, 1978, Ser. No. 910,475
Int. Cl.[2] B44C 1/16; B32B 27/36, 23/04
U.S. Cl. 428—200 **5 Claims**

1. A heat release type decalcomania for application to a section of textile material formed of felted polyamide-containing textile material which is thereafter adapted for vulcanizing to a rubber surface in a mold comprising;

(a) a paper-like wax-free flexible temporary carrier strip;

(b) a clear film on one surface of said carrier strip formed of a mixture containing a blocked isocyanate stable at room temperature in a mixture containing a polyester, and a silicone modified polyester which when heated to heat release temperature for application of said decalcomania are adapted to react to form a thermoset elastomeric film and effect the release of said clear film from said carrier strip, and said thermoset elastomeric film also having high temperature mold release properties when heated in said mold; and

(c) a pigmented thermoplastic elastomeric design fixedly supported by said clear film formed of a first pigmented layer of thermoplastic elastomer which is comprised of a blend of polyamide resins having a softening point of about 100° F. (38° C.) and a second pigmented layer of thermoplastic elastomer superimposed on said first pigmented layer comprised of a blend of polyamide resins having a softening point of about 230° F. (110° C.), said first and second pigmented layers when heated above said softening points during the heating to effect release of said clear film from said carrier strip and during said vulcanizing having a viscosity which enables said layers penetrating deeply into said felted polyamide-containing textile material, and said second layer being non-tacky and resistant to offsetting when placed in contact with said carrier strip at room temperature.

4,234,644
COMPOSITE LAMINATION FILM FOR ELECTROPHORETICALLY TONED IMAGES

Stephen D. Blake, and Katherine J. Lewis, both of Los Angeles, Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Continuation of Ser. No. 889,647, Mar. 24, 1978, abandoned. This application Jan. 18, 1979, Ser. No. 4,366
Int. Cl.[3] B32B 7/14, 9/04; C09J 5/00
U.S. Cl. 428—204 **9 Claims**

1. A composite lamination film for electrophoretically toned images deposited on a plastic dielectric receptor sheet, comprising, in combination:

an optically transparent, flexible support layer of a material selected from the group consisting of polyethylene terephthalate, polycarbonate, polysulfone, cellulose triacetate or a vinyl chloride/vinylidene chloride copolymer resin, and of a thickness of from 0.1 to 7.0 mils;

an optically transparent, flexible intermediate layer of a heat softenable film of a material selected from the group consisting of low density polyethylene resin, polypropylene resin or copolymer resin of ethylene or propylene with

relatively small amounts of vinyl or acrylic monomers, and of a thickness from about 0.05 to 4.0 mils, and applied to one side of said support layer, said intermediate layer having good adhesion to said support layer; and

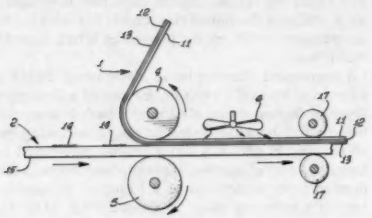
an optically transparent, flexible adhesive layer of a heat softenable film comprising a low molecular weight fatty polyamide or polyacrylic resin, and of a thickness from about 0.05 to 2.5 mils, and applied to the free side of said intermediate layer, said adhesive layer having good adhesion to said intermediate layer and adapted to have good adhesion to said receptor sheet and said toned images deposited on said receptor sheet, said adhesive layer reaching a low melt viscosity at or below 120° C. to insure good penetration of said dried toner deposits.

9. A process for preparing a composite laminate containing electrophoretically toned images which comprise the steps of:

heating a laminating film to a temperature of from about 80° C. to 160° C. to soften intermediate and adhesive layers thereof, said laminating film comprising, in combination:

an optically transparent support layer of flexible, shrink and scratch resistant, mechanically strong film, said support layer having a sufficiently high melting point to remain undistorted in the presence of heat softened adhesives, said support layer selected from the group consisting of polyethylene terephthalate, polycarbonate, polysulfone, cellulose triacetate or a vinyl chloride/vinylidene chloride copolymer resin, and of a thickness of from 0.1 to 7.0 mils,

an optically transparent intermediate layer of a flexible, heat softenable film applied to one side of said support layer,



said intermediate layer having good adhesion to said support layer, said intermediate layer having good chemical compatibility with an adhesive layer, said intermediate layer having a moderately high molecular weight to give high tensile strength to the laminate bond, said intermediate layer softening below the distortion point of said support layer and adhering to said adhesive layer and said support sheet, said intermediate layer selected from the group low density polyethylene resin, polypropylene resin or copolymer resin of ethylene or propylene with relatively small amounts of vinyl or acrylic monomers, and of a thickness from about 0.05 to 4.0 mils, and

an optically transparent adhesive layer of a flexible, heat softenable film applied to the free side of said intermediate layer, said adhesive layer having good adhesion to said intermediate layer and to a receptor sheet and said toned images deposited on said receptor sheet, said adhesive layer softening below the distortion point of said support layer, said adhesive layer reaching a low melt viscosity at or below 120° C. to insure good penetration of said dried toner deposits, said adhesive layer having a relatively low molecular weight, a relatively non-polar character and a proportionately high aliphatic hydrocarbon content to be compatible with said dried toner deposits and said intermediate layer, said adhesive layer showing no blocking or distortion, said adhesive layer comprising a low molecular weight fatty polyamide or polyacrylic resin, and of a thickness from about 0.05 to 2.5 mils;

applying said laminating film to an optically transparent receptor sheet to form a composite laminate, said receptor sheet comprising

an optically transparent sheet of flexible, shrink and scratch resistant, mechanically strong film, said sheet having a sufficiently high melting point to remain undistorted in the presence of heat softened adhesives, said sheet having electrophoretically toned images deposited thereon; and

cooling said composite laminate to a temperature at which the adhesive resin layers resolidify.

4,234,645

PHARMACEUTICAL COMPOSITION

Harald Gunther, and Herbert C. Fleisch, both of Bern, Switzerland, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 782,580, Mar. 29, 1977, abandoned.
This application Aug. 4, 1978, Ser. No. 931,072
Int. Cl.[2] A61K *31/66*
U.S. Cl. 424—204 **6 Claims**

1. A method for treating ankylosing spondylitis in humans and lower animals comprising administering to a human or lower animal in need of such treatment a safe and effective amount of a pharmaceutically-acceptable dichloromethane diphosphonate compound selected from the group consisting of dichloromethane diphosphonic acid, salts of dichloromethane diphosphonic acid, and alkyl and aryl esters of dichloromethane diphosphonic acid.

4,234,646

ENGRAVING BOARD FOR PRINT-PRODUCTION

Sadao Fujimori, Tokyo, Japan, assignor to Tokyo Shobundo & Co., Ltd., Japan

Continuation of Ser. No. 842,339, Oct. 14, 1977, abandoned.
This application Jun. 19, 1979, Ser. No. 49,979
Claims priority, application Japan, Aug. 23, 1977, 52-112709
Int. Cl.[3] B32B *7/02, 29/02;* B41F *9/02*
U.S. Cl. 428—215 **9 Claims**

1. An engraving board for printing a design with coloring media comprising,

a base paper layer,

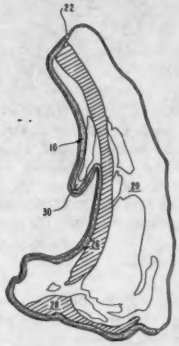
a middle paper layer overlaying at least a portion of said base paper layer and secured thereto by an adhesive, and

a water absorbent printing layer comprising a multiplicity of densely packed unwoven short fibers overlaying said middle paper layer and water-resistantly secured thereto, said printing layer can be cut to remove a portion thereof for exposing a portion of said middle paper layer and leaving a remaining portion of said printing layer in the shape of the design to be printed whereby the coloring medium is laid over the engraving board and is absorbed into the exposed portion of said middle paper layer.

4,234,647
MEAT PACKAGING OF FOAM AND OXYGEN IMPERVIOUS MATERIAL

Robert E. Murphy, Downers Grove, and Harry F. Bernholdt, Lombard, both of Ill., assignors to Swift & Company, Chicago, Ill.

Division of Ser. No. 835,421, Sep. 21, 1977, Pat. No. 4,136,203, which is a continuation-in-part of Ser. No. 703,593, Jul. 8, 1976, abandoned. This application Dec. 29, 1978, Ser. No. 974,565
Int. Cl.[3] B65D 33/02
U.S. Cl. 428—220 1 Claim



1. As an article of manufacture an improved puncture resistant cushion film for use in the packaging of meat items, said cushion film comprising:

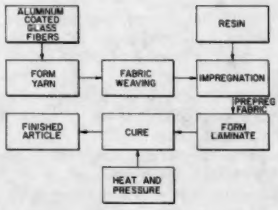
an outer film layer of oxygen impermiable material; and

a meat contacting surface comprised of a separate cushion film of an open celled foam of about 1/16–¼ inch thick capable of both absorbing liquids and of closely conforming to the surface shape of the meat, and said meat contacting surface is coated on its meat contacting surface with a non-toxic adhesive.

4,234,648
ELECTRICALLY CONDUCTIVE PREPREG MATERIALS

Gary L. Patz, Walnut Creek, and Donald E. Davenport, Palo Alto, both of Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Filed Jan. 29, 1979, Ser. No. 7,096
Int. Cl.[2] B32B 7/00
U.S. Cl. 428—245 24 Claims

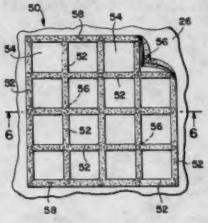


1. A prepreg material comprising a fabric web woven of a multiplicity of fiber bundles, each bundle including a plurality of fibers of a dielectric material, at least some of said fibers having been coated on their outer surfaces with a layer of an electrically conductive material over the entire length of said coated fibers prior to said fabric being woven, at least some of said coated fibers extending throughout said fabric in the direction in which their corresponding bundles are woven providing a continuous electrical conductor, and an uncured resin carried by the fabric after being woven.

4,234,649
BINDER MATERIAL SEAM

Robert C. Ward, Bay Shore, N.Y., assignor to Commercial Affiliates, Inc., New York, N.Y.

Filed May 24, 1976, Ser. No. 688,943
Int. Cl.[2] B32B 7/00
U.S. Cl. 428—255 20 Claims



1. Binder material comprising a grid-like frame construction for stripably binding covering material to rigid holding surface, said binder material comprising a first outer surface and a second outer surface, said first outer surface being next to said holding surface, said binder material comprising a plurality of spaced frame elements intersecting each other to form a grid-like frame construction, said frame elements being coated with pressure sensitive adhesive, said adhesive coating being present only on said frame elements, said adhesive on said frame elements being positioned on said first outer surface which is next to said holding surface and on said second outer surface, and the pressure sensitive adhesive comprises the property of being strippable from both the holding surface and the covering material.

4,234,650
LAMINAR CARBON MEMBER AND A METHOD OF MANUFACTURING IT

Franz Schieber, Pegnitzstrasse 12, D-8505 Röthenbach a.d. Pegnitz, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,528
Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2724131
Int. Cl.[2] B32B 9/00, 33/00
U.S. Cl. 428—280 13 Claims

1. A thin laminar porous carbon member having a gross density of 0.1 to 0.8 gm/cm, a thickness of 0.1 to 5 mm and a ratio of surface area to thickness of at least 10^5 produced by carbonizing a carbon fiber felt impregnated with a heat and pressure hardened carbonaceous binder coating substantially all the carbon fibers of the felt in such a manner that the porosity of the felt is retained.

7. A method of forming a thin carbon member from a hardenable binder and porous carbon felt, said carbon felt being formed of carbon fibers, said method comprising the steps of;

(a) impregnating said porous felt with a carbonaceous, hardenable and cokable binder such that substantially all of said fibers are coated with said binder;

(b) eliminating some of said binder from said porous felt to the extent that said impregnated felt is porous; and

(c) hardening said binder with heat and pressure to produce a rigid, partially impregnated, porous carbon member

(d) carbonizing said member by heating to produce a rigid, high strength, dimensionally stable and porous carbon member having a gross density of 0.1 to 0.8 g/cm, a thickness of 0.1 to 5 mm, and a surface area to thickness ratio of at least 10^5.

13. A method comprising the step of binding a plurality of

thin laminar carbon members produced by the method of claim 7.

4,234,651

PROCESS FOR THE MANUFACTURE OF A NON-WOVEN PRODUCT HAVING HIGH SHEAR STRENGTH AND DIMENSIONAL STABILITY

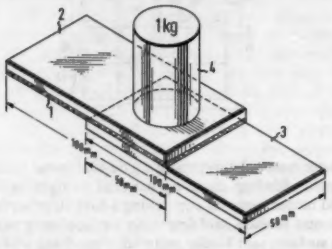
Helmut Kuhn, Königstein, and Kurt Seiler, Abtsteinach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 904,996

Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721959

Int. Cl.³ B32B *27/00*

U.S. Cl. 428—290 **4 Claims**



1. A process for the manufacture of a spunlaid product of crimp-free polyester filaments by deposition and bonding of the filaments, wherein the filaments consist of polyethyleneglycol terephthalate, and the bonding is obtained by needling and subsequent impregnation with a binder liquor; the needling being carried out by placing 80 to 300 stitches/cm^2, preferably 80 to 150 stitches/cm^2 at a depth of stitch of 11 to 20 mm, preferably 12 to 17 mm; and the impregnation being carried out with an aqueous dispersion of a copolymer containing

from 47 to 59 weight % of styrene,

from 33 to 45 weight % of butadiene,

from 3 to 4 weight % of acrylic acid and

from 3 to 4 weight % of acrylic acid amide.

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MICROFIBROUS STRUCTURES

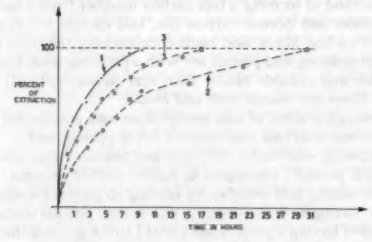
Pier L. Vanoni, San Donato Milanese; Giancarlo Serboli, Soronno, and Franco De Marchi, Milan, all of Italy, assignors to Anic, S.p.A., Palermo, Italy

Continuation of Ser. No. 722,137, Sep. 10, 1976, abandoned. This application Apr. 6, 1979, Ser. No. 27,868

Claims priority, application Italy, Sep. 12, 1975, 27206 A/75; Aug. 13, 1976, 26263 A/76

Int. Cl.³ D04H *1/04*

U.S. Cl. 428—296 **3 Claims**



1. A microfiber of irregular cross section having a length ranging from 1 to 10 millimeters with an average diameter of about 1.0 micron consisting of a synthetic, fiber-forming, thermoplastic polymeric material selected from the group consisting of low-density polyethylene, copolymers of ethylene with vinyl acetate and acrylic acid, high density polyethylene, relevant ethylene copolymers, polypropylene, polyvinyl acetate, polyvinyl alcohol, polystyrene, polyamides, polyethylene terephthalate, cellulose acetate, polyvinyl chloride, and having incorporated therewith by adsorption a material selected from the group consisting of medicaments, antiseptics, pesticides, microorganisms preservatives and sequestering agents.

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PROTECTIVE COATING

Norman E. Ballard; Frank Cork, both of Derby; Philip H. Andrews, Solihull, and Francis Chappell, Halesowen, all of England, assignors to Rolls-Royce Limited, London, England

Continuation of Ser. No. 607,993, Aug. 26, 1975, abandoned. This application May 24, 1977, Ser. No. 800,016

Claims priority, application United Kingdom, Aug. 31, 1974, 38149/74

Int. Cl.³ B32B *5/16, 15/20, 17/06*

U.S. Cl. 428—328 **7 Claims**

1. A metal article having thereon a heat-resistant protective coating, said coating consisting essentially of:

(a) a glass matrix which has as its major constituent, a eutectic of PbO-B_2O_3 and contains about 84% by weight of PbO;

(b) from about 50 to about 78% by weight of aluminum particles in the size range of 5 to 10 microns dispersed in said glass matrix; and

(c) a metal chromate selected from the group consisting of zinc chromate, strontium chromate, barium chromate and mixtures thereof, and

(d) an organophilic cation modified clay; the glass matrix and aluminum particles being substantially chemically non-reactive with respect to each other.

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HEAT WAVE-REFLECTIVE OR ELECTRICALLY CONDUCTIVE LAMINATED STRUCTURE

Toshiaki Yatabe, Hino; Shigenobu Sobajima, and Ikuto Sugiyama, both of Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 9, 1979, Ser. No. 56,192

Claims priority, application Japan, Jul. 11, 1978, 53-83582

Int. Cl.³ B32B *7/02, 27/36, 15/04*

U.S. Cl. 428—333 **12 Claims**

1. A heat wave-reflective or electrically conductive laminated structure composed of

(A) a shaped solid substrate,

(B) a transparent thin layer having a high refractive index in contact with said substrate (A),

(C) a transparent heat wave-reflective layer of an electrically conductive metal in contact with said layer (B), and

(D) optionally, a transparent thin layer having a high refractive index (D') in contact with said layer (C) and a transparent top layer (D'') in contact with said transparent thin layer (D');

characterized in that said layer (C) is a layer composed of Ag and Au in which the amount of Au is 3 to 30% by weight based on the total weight of Ag and Au.

10. The laminated structure of claim **1** wherein the layer (B) has a thickness of 50 to 1,000 A.

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HEAT-ADHESIVE COMPOSITE FIBERS

Kohichi Kunimune, Moriyamashi; Teruaki Hane, Shigaken; Seigo Inadomi, Moriyamashi, and Yasuhiko Furukawa, Kusatsushi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 31,989, Apr. 20, 1979, which is a continuation of Ser. No. 842,660, Oct. 11, 1977, abandoned.
This application Aug. 1, 1979, Ser. No. 62,814
Claims priority, application Japan, Oct. 20, 1976, 51-125723; Dec. 13, 1976, 51-149597; Apr. 12, 1977, 52-41685
Int. Cl.[2] D02G *3/00*
U.S. Cl. 428—374 9 Claims

1. Heat-adhesive composite fibers having a denier within the range of 1–20, and comprising

(a) a first component of crystalline polypropylene, and

(b) a second component selected from the group consisting of

(1) an ethylene-vinyl acetate copolymer,

(2) a saponification product thereof,

(3) a polymer mixture of an ethylene-vinyl acetate copolymer with polyethylene, and

(4) a polymer mixture of a saponification product of an ethylene-vinyl acetate copolymer with polyethylene,

said copolymer containing 0.5–18 mol % of vinyl acetate units based upon the total of vinyl acetate units and ethylene units,

said saponification product containing 0.5–18 mol % of vinyl monomer units consisting of vinyl alcohol units and vinyl acetate units based upon the total of vinyl alcohol units, vinyl acetate units and ethylene units,

said polymer mixtures consisting of 70% by weight or less of said copolymer or said saponification product and 30% by weight or more of said polyethylene,

said polymer mixtures containing 0.5–18 mol % of vinyl monomer units consisting of vinyl alcohol units and/or vinyl acetate units based upon the total of vinyl acetate units, vinyl alcohol units and ethylene units of the said polymer mixtures,

the composite ratio of said first component to said second component being in the range of 40:60 to 70:30,

said first and second components being joined together along an axially extending interface, and

said second component forming at least 50% of the exterior surface of the composite fibers continuously in the longitudinal direction of the fibers so as to give the composite fibers heat-adhesive properties.

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REPROCESSABLE THERMOPLASTIC GRAFT COPOLYMER OF PROPYLENE POLYMER AND ETHYLENE COPOLYMER

Amar Amembal, Edison; Robert Bostwick, Somerset, both of N.J., and Richard G. Shaw, Remsen, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 20, 1978, Ser. No. 971,182
Int. Cl.[3] C08L *23/08, 23/12*
U.S. Cl. 428—379 14 Claims

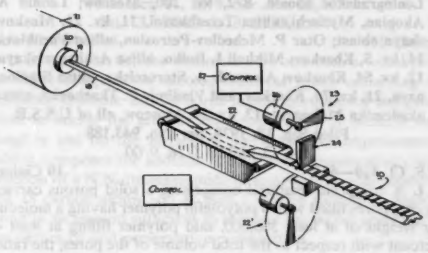
1. A reprocessable graft copolymer comprising (A) ethylene copolymer containing more than 60 weight percent ethylene and at least one comonomer selected from the group consisting of vinyl acetate and alkyl acrylates or methacrylates and (B) propylene polymer grafted to said ethylene copolymer with from about 0.1 to about 0.75 weight percent, based on the weight of (A) and (B), of a peroxide having a half life of one minute at ≥140° C.

4,234,657

FOAMABLE THERMOPLASTIC STICK AND FOAMED ELEMENT MADE THEREFROM

Harry Bussey, Jr., P.O. Box 115 Serpentine Rd., Navesink, N.J. 07752

Division of Ser. No. 886,075, Mar. 13, 1978. This application Mar. 5, 1979, Ser. No. 17,133
Int. Cl.[2] B32B *1/00*; D02G *3/00*
U.S. Cl. 428—400 10 Claims



1. A straight stick of foamable thermoplastic material having a substantially uniform cross-sectional shape along a longitudinal axis, and a plurality of grooves in at least one surface thereof extending width-wise of said longitudinal axis.

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WOOD COMPOSITES WITH FOLIAGE ADHESIVE

Suezone Chow, Vancouver, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 771,992, Feb. 25, 1977, Pat. No. 4,082,903. This application Mar. 6, 1978, Ser. No. 883,951
Int. Cl.[3] B32B *21/02*
U.S. Cl. 428—403 17 Claims

1. A method of bonding wood or bark to form composite products comprising:

(a) subdividing plant foliage to a fine particle size;

(b) uniformly contacting the wood or bark to be bonded with adhesive which consists essentially of one of,

(i) said subdivided foliage,

(ii) said subdivided foliage with up to 20% formaldehyde by weight of the adhesive, and

(iii) said subdivided foliage having its natural acid pH raised to neutral or alkaline pH, said adhesive being present in sufficient amounts to bond the wood or bark,

(c) subjecting the crude composite to bonding pressure at a selected temperature above the softening temperature of the foliage, the selected temperature being high enough to give the desired bond strength; and

(d) recovering the hot-pressed composite wood or bark product.

4,234,659

COMPOSITE MATERIAL AND METHOD OF PRODUCING SAME

Leonid A. Kostandov, Vorobievskoe shosse, 6, kv. 4; Nikolai S. Enikolopov, Kutuzovsky prospekt, 26, kv. 245; Fridrikh S. Dyachkovsky, Vorobievskoe shosse, 2-b, kv. 9; Ljudmila A. Novokshonova, ulitsa 26 Bakinskikh komissarov, 7, korpus 4, kv. 38; Jury A. Gavrilov, Chistoprudny bulvar, 14, kv. 57, all of, Moscow; Olga I. Kudinova, poselok Kratovo, ulitsa Malakhovskaya, 15, Moskovskaya oblast; Tatyana A. Maklakova, Leningradskoe shosse, 8/2, kv. 200, Moscow; Leonid A. Akopian, Mytischi, ulitsa Tereshkovoi, 11, kv. 21, Moskovskaya oblast; Otar P. Mchedlov-Petrosian, ulitsa Vorobieva, 14, kv. 5, Kharkov; Mikhail I. Boiko, ulitsa Arkhangelskaya, 12, kv. 54, Kharkov; Alexandr A. Staroselsky, ulitsa Stadionnaya, 21, kv. 76, Kharkov, and Vladimir P. Tkachenko, ulitsa akademika Makarova, 13, kv. 24, Moscow, all of U.S.S.R.

Filed Sep. 18, 1978, Ser. No. 943,188

Int. Cl.[3] B32B *5/16, 9/00*

U.S. Cl. 428—403 **10 Claims**

1. A composite material comprising a solid porous carrier having pores filled with a polyolefin polymer having a molecular weight of at least 300,000, said polymer filling at least 4 percent with respect to the total volume of the pores, the ratio of the carrier mass to the mass of the polymer being 50–99.5:-50–0.5.

4,234,660

PRESSURE SENSITIVE ADHESIVE COMPOSITIONS CONTAINING A POLYMETALOXANE AND ARTICLE

Lawrence W. McKenna, Jr., Wilbraham; Ronald S. Finkelstein, Longmeadow, and John K. Haynes, Jr., Springfield, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 863,113, Dec. 22, 1977, Pat. No. 4,185,051.

This application Sep. 17, 1979, Ser. No. 76,008

Int. Cl.[3] B32B *27/08, 27/30, 27/32, 27/36*

U.S. Cl. 428—411 **17 Claims**

1. An article coated with a pressure sensitive resin composition comprising:

A. an interpolymer having a weight average molecular weight in the range of about 10,000 to about 500,000 and a glass transition temperature in the range of about −15° C. to about −75° C., the interpolymer comprising:

a. from about 0.5 to about 20 weight percent of at least one monomer containing a hydroxyl or carboxyl group, and

b. at least one acrylic ester containing from six to 20 carbon atoms; and

B. at least one polymetaloxane having the formula $(M_nO_{n-1})(OR)_{2n+2}$ wherein M is titanium or zirconium, n is an integer of from 2 to 20 and R is selected from the group consisting of aliphatic, substituted aliphatic, alicyclic and substituted alicyclic radicals containing from 2 to 10 carbon atoms and wherein the polymetaloxane is present in an amount sufficient to improve the cohesive strength of the dry pressure sensitive resin composition.

4,234,661

POLYCRYSTALLINE DIAMOND BODY/SILICON NITRIDE SUBSTRATE COMPOSITE

Minyoung Lee, Schenectady; Lawrence E. Szala, Scotia, and Robert C. DeVries, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

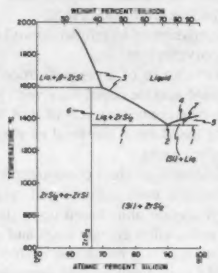
Continuation of Ser. No. 844,449, Oct. 21, 9177, abandoned.

This application Mar. 12, 1979, Ser. No. 19,366

Int. Cl.[3] B32B *9/04*

U.S. Cl. 428—446 **10 Claims**

1. A composite consisting essentially of a polycrystalline diamond body integrally bonded to a substrate of polycrystalline silicon nitride, said polycrystalline diamond body consisting essentially of a mass of diamond crystals adherently bonded together by a bonding medium consisting essentially of silicon carbide and a carbide and/or silicide of a metal component which forms a silicide with silicon and which forms a eutectiferous alloy with silicon, said metal component of said metal silicide being selected from the group consisting of cobalt, chromium, iron, hafnium, manganese, molybdenum, niobium, nickel, palladium, platinum, rhenium, rhodium, ruthenium, tantalum, thorium, titanium, uranium, vanadium, tungsten, yttrium, zirconium and alloys thereof, said metal component of said metal carbide being selected from the group consisting of chromium, hafnium, titanium, zirconium, tantalum, vanadium, tungsten, molybdenum, and alloys thereof, said diamond crystals ranging in size from about 1 micron to about 1000 microns, the volume of said diamond crystals ranging from at least about 70% by volume up to about but less than 90% by volume of said body, said bonding medium being present in an amount ranging up to about 30% by volume of said body, said bonding medium being distributed substantially uniformly throughout said body, the portion of said bonding medium in contact with the surfaces of said diamond crystals being at least in a major amount silicon carbide, said diamond body being substantially pore-free, said substrate consisting essentially of a hot-pressed or sintered polycrystalline silicon nitride body ranging in density from about 80% to about 100% of the theoretical density of silicon nitride and containing silicon nitride in an amount of at least 90% by weight of said substrate and being free of constituents which have a significantly deleterious effect on the mechanical properties of said composite, said polycrystalline diamond body forming an interface with said silicon nitride substrate wherein said bonding medium extends from said polycrystalline diamond body into contact with said silicon nitride substrate at least substantially filling pores throughout said interface so that said interface is substantially pore-free, the distribution and thickness of the bonding medium throughout said interface being substantially the same as the distribution and thickness of the bonding medium throughout said polycrystalline diamond body of said composite.



4,234,662

PRESSURE SENSITIVE HOT MELT ADHESIVE CURABLE BY EXPOSURE TO ELECTRON BEAM RADIATION

Stephen D. Pastor, Spring Valley, N.Y., and Stuart H. Ganslaw, Morristown, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 26, 1979, Ser. No. 33,199

Int. Cl.[2] B05D *3/06*

U.S. Cl. 428—500 **10 Claims**

1. A method for the production of a hot melt adhesive composition having pressure sensitive properties comprising the steps of

(a) copolymerizing allyl acrylate or methacrylate with at least one copolymerizable acrylic monomer, obtaining thereby a prepolymer solid at ambient temperature;

(b) heating the resultant solid allylic unsaturated prepolymer to a temperature sufficient to render it fluid and flowable;

(c) coating the fluid prepolymer onto a substrate; and

(d) exposing the coated substrate to electron beam radiation

of 1–4 megarads sufficient to crosslink the prepolymer, thereby providing a cured pressure sensitive adhesive.

4,234,663

THERMOPLASTIC MULTI-LAYER FOIL STRUCTURE

Raymond Catte, Cuqueron; Robert Laputte, Pau; Jean-Claude Moulies, Dagneux, and Jean-Pierre Lalaün, Pau, all of France, assignors to ATO Chimie, Paris, France

Filed Jan. 29, 1979, Ser. No. 7,514

Claims priority, application France, Jan. 30, 1978, 78 02554

Int. Cl.[3] B32B *27/08, 5/16*

U.S. Cl. 428—517 18 Claims

1. A thermoplastic multi-layer foil structure comprising a thermoplastic styrenic polymer layer comprising at least one polymer selected from the group consisting of styrene, methyl styrene, chlorostyrene and mixtures thereof, copolymers containing at least 50% styrene, methyl styrene, chlorostyrene and mixtures thereof and acrylonitrile, methacrylonitrile, a C_1 to C_4 alkyl acrylate, a C_1 to C_4 alkyl methacrylate, butadiene, isoprene, and polymers of styrene, methylstyrene and chlorostyrene, and mixtures thereof modified with polybutadiene or polyisoprene, a thermoplastic olefinic polymer layer comprising at least one polymer selected from the group consisting of polymers of alpha olefins containing 2 to 6 carbon atoms and mixtures thereof, polymers containing at least 50% by weight of alpha olefins containing 2 to 6 carbon atoms with vinyl alkanoates, alkylacrylates, alkylmethacrylates and mixtures thereof, bonded by an intermediary polymer layer comprising at least one layer comprising a bonding agent, wherein at least one layer containing scrap produced from the multi-layer foil structure is included in the multi-layer foil structure intermediate of said styrenic and olefinic polymer layers, said scrap-containing layer comprising a mixture of said scrap with a graft copolymer in a ratio of graft copolymer to scrap of from 0.2:1 to 9:1 wherein the graft copolymer comprises at least one polyolefinic substrate selected from the group consisting of polymers of C_2 to C_6 alpha-olefin monomers and mixtures thereof, polymers of said alpha-olefin monomers and a diene, polymers of said alpha olefin monomers and vinyl monomers having grafted thereon from 10 to 50% by weight of a styrenic monomer selected from the group consisting of styrene, methyl styrene, chlorostyrene, and mixtures thereof, and mixtures of at least one of said monomers with a minor amount of at least one monomer selected from the group consisting of acrylonitrile, methacrylonitrile, alkylacrylates, alkylmethacrylates, butadiene, and isoprene.

4,234,664

ORIENTED POLYOLEFIN FILM

Brian N. Hendy, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 762,157, Jan. 24, 1977. This application Mar. 30, 1979, Ser. No. 25,599

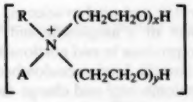
Claims priority, application United Kingdom, Feb. 6, 1976, 4767/76

Int. Cl.[3] B32B *27/32*

U.S. Cl. 428—520 8 Claims

1. An oriented polyolefin film comprising a polyolefin substrate having on at least one surface thereof a mixture comprising:

(a) a quaternary ammonium salt of the formula:



wherein X is a univalent anion or an equivalent of a multivalent anion, x and y are positive integers the sum of which is from 2 to 5, A is a lower alkyl group containing from 1 to 6 carbon atoms, and R is a univalent aliphatic radical containing from 1 to 22 carbon atoms, and (b) a monoethoxylated quaternary ammonium salt.

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OIL-BORNE CREOSOTE AND PENTACHLOROPHENOL WOOD PRESERVATIVE COMPOSITIONS CONTAINING DIMETHYLAMIDE

Titus M. Johnston, Nesbit, Miss., assignor to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Oct. 17, 1979, Ser. No. 85,567

Int. Cl.[3] B05D *1/18;* B18K *3/40*

U.S. Cl. 428—541 11 Claims

1. In a process for the treatment of wood with a wood preservative composition selected from the group consisting of oil-borne creosote and oil-borne pentachlorophenol compositions to inhibit the growth and proliferation of bacteria and fungi in and on the surface of the wood, the improvement which comprises the addition to said wood preservative composition of a N,N-dimethylamide of a carboxylic acid containing 18 carbon atoms and at least 1 carbon to carbon double bond in an amount sufficient to increase the wood penetrative properties of said preservative composition.

4,234,666

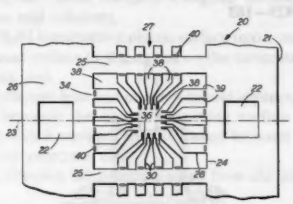
CARRIER TAPES FOR SEMICONDUCTOR DEVICES

Michael T. Gursky, Allentown, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jul. 26, 1978, Ser. No. 928,134

Int. Cl.[2] H02G *13/08;* H05K *5/00, 15/00*

U.S. Cl. 428—573 9 Claims



1. A tape which comprises:

a continuous web having at least an electrical conductor strip;

at least one pattern in the continuous web;

at least one cluster of finger-like leads in the pattern which leads have free ends that project toward the center of the cluster and opposite ends fixed to the web; and

at least one stress-relief means at a stress-relief site in each of the leads formed by reducing the cross sectional area of the lead to weaken the cross section and located symmetrically about the longitudinal centerline of each lead for absorbing flexure and tensile stresses by concentrating the stresses to plastically deform the leads at the stress-relief sites to form the finger-like leads into a spaced relationship with the plane of the tape during an inner lead bonding operation.

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BATTERY AND METHOD FOR FABRICATING SAME

Douglas N. Bennion, Bellevue, Wash., and Su-Chee S. Wang, Los Angeles, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 2, 1979, Ser. No. 16,929

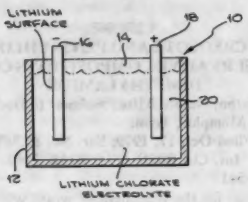
Int. Cl.[3] H01M *6/36*

U.S. Cl. 429—81 28 Claims

1. An electrical battery comprising:

a positive electrode;

an electrolyte comprising molten lithium chlorate or lithium perchlorate; and



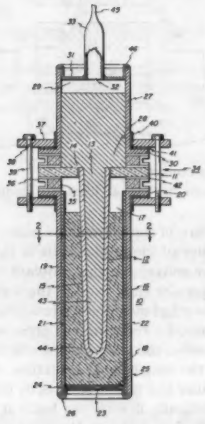
a negative electrode comprising elementary lithium in contact with said electrolyte.

4,234,668

COMPOSITE SULFUR ELECTRODE CONTAINER AND METHOD OF MANUFACTURE

Dong-Sil Park; Manfred W. Breiter, both of Schenectady, and Rendall N. King, Johnstown, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,485
Int. Cl.³ H01M 2/02
U.S. Cl. 429—163 **3 Claims**



1. A composite sulfur electrode container for use as a portion of a sodium-sulfur cell which comprises an outer metallic casing portion readily corroded by liquid sulfur and polysulfides, the outer casing having opposite open ends, a metallic foil portion substantially corrosion resistant to liquid sulfur and polysulfides bonded to the inner surface of the outer casing portion, a chromium layer portion bonded to the opposite surface of the foil portion, the chromium layer portion containing in excess of 60 weight percent chromium, a metallic end cap adapted to fit and to be sealed within and adjacent one open end of the container, and at least the inner surface of the end cap substantially corrosion resistant to liquid sulfur and polysulfides.

4,234,669

CRT SCREEN STRUCTURE PRODUCED BY PHOTOGRAPHIC METHOD

Samuel Pearlman, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 800,285, May 25, 1977, abandoned. This application Mar. 27, 1979, Ser. No. 24,391
Int. Cl.³ G03C 5/00
U.S. Cl. 430—25 **10 Claims**

1. A method for producing a screen structure on a surface for a cathode-ray tube including

(a) exposing a film of water-soluble photopolymeric material on said surface to a light image until the solubilities of the irradiated regions of said film are selectively reduced,

(b) flushing said exposed film with an aqueous medium that is free from borate ions to remove only the regions of greater solubilities, thereby producing a stencil on said surface,

(c) rinsing said stencil and support surface with an aqueous solution containing borate ions whereby an encapsulating skin is formed on said stencil for preventing further removal of material from said stencil by subsequently-applied aqueous media,

(d) then overcoating said stencil and the surface not covered by said stencil with pigment material,

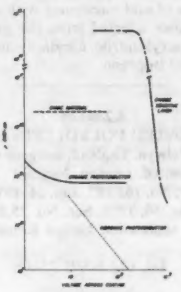
(e) and then removing only said stencil and the overcoating thereon.

4,234,670

REDUCIBLE METAL SALT-DRY ELECTROGRAPHIC VISIBLE IMAGE RECORDING PROCESS

Joseph Y. Kaukeinen, and Duane A. Rockafellow, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 624,815, Oct. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 492,814, Jul. 29, 1974, abandoned. This application Sep. 27, 1979, Ser. No. 79,642
Int. Cl.³ G03G 13/22, 13/24, 13/12
U.S. Cl. 430—52 **26 Claims**



1. A dry electrographic recording process for producing a visible image in a charge-sensitive recording element having an ohmic resistivity of at least about 1×10^{10} ohm-cm and containing at least one reducible metal salt, said process comprising the steps of:

(a) applying an electric potential to selected portions of said recording element of a magnitude and for a sufficient period of time to produce in said portions a charge density of from approximately 1 microcoulomb/cm^2 to approximately 1 millicoulomb/cm^2 said charge density forming a developable pattern of latent image sites; and

(b) heating the entire recording element substantially uniformly in the presence of a reducing agent until a sufficient quantity of said metal salt is reduced at said image sites to form a visible image.

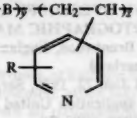
4,234,671

COLOR DIFFUSION TRANSFER DYE MORDANT

Hideaki Iwama, Tachikawa; Mikio Koyama, Tokorosawa; Masao Asano, and Yasuo Tsuda, both of Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1979, Ser. No. 21,800
Claims priority, application Japan, Mar. 20, 1978, 53/32100
Int. Cl.[2] G03C 1/40
U.S. Cl. 430—213 3 Claims

1. A color diffusion transfer photographic material comprising a support, a photosensitive layer containing a silver halide emulsion, at least one layer containing a dye mordant and at least one layer containing a dye image forming substance wherein the dye mordant-containing layer comprises a water-dispersible particulate polymer mordant comprising units represented by the general formula:



wherein A is a polymerized monomer unit containing at least 2 ethylenically unsaturated groups; B is a polymerized copolymerizable α,β-ethylenically unsaturated monomer unit; and R is a hydrogen atom or a methyl or ethyl group; x, y and z individually represent a mole proportion, and x is 1–3 mol %, y is 7–49 mol % and z is 50–90 mol %.

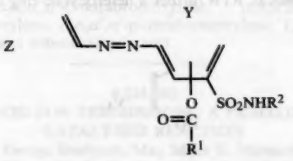
4,234,672

SHIFTED PHOTOGRAPHIC DYES AND COMPOSITIONS, ELEMENTS AND PROCESSES EMPLOYING THEM

John A. Ford, and Gregory J. Lestina, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,463
Int. Cl.[3] G03C 3/02, 1/10
U.S. Cl. 430—222 28 Claims

1. A photographic element comprising a support, at least one photosensitive silver halide emulsion layer and, associated with the silver halide emulsion layer, a photographic image dye of the formula:



wherein:

Z represents the atoms to complete an aromatic carbocyclic or heterocyclic nucleus having at least one ring of 5 to 7 atoms;

Y represents the atoms to complete a benzene or naphthalene nucleus;

is ortho to the sulfamoyl group;

R^1 is a tertiary alkyl group of 4 to 20 carbon atoms or a tertiary amino group of the formula $—N(R^3)_2$ where each R^3 is independently alkyl of 1 to 10 carbon atoms or aryl of 6 to 20 carbon atoms; and

R^2 is a primary or secondary alkyl group of 1 to 20 carbon atoms.

4,234,673

MANUFACTURE OF SIGNS USING PHOTOIMAGING AND HEAT TRANSFER

Simon L. Scrutton; John V. Shepherd; John S. Thornley, all of London, England, and Eric M. Sutton, Nairobi, Kenya, assignors to Letraset Corporation, Paramus, N.J.

Filed Dec. 20, 1978, Ser. No. 971,447
Claims priority, application United Kingdom, Dec. 21, 1977, 53243/77
Int. Cl.[3] G03C 11/12, 5/00
U.S. Cl. 430—252 14 Claims

1. The method of manufacturing a subsurface sign legend which comprises

forming a composite material by applying to a coating layer a transparent or translucent substrate, said coating layer comprising a photosensitized organic polymeric material whose adhesion to the substrate increases on exposure to light,

imagewise exposing the composite material through the substrate to a sign legend whereby the adhesion of the polymeric material to the substrate in the areas exposed to light is increased, and

developing the imagewise exposed material by application of a water spray to remove the polymeric composition from the unexposed areas to leave a legend formed in sign indicia on said substrate,

bringing a light transmitting plastic surface into contact with the exposed surface of the legend on the substrate to form a laminate, and

applying sufficient heat and pressure to said laminate to form a bond between the light transmitting surface and the indicia which is stronger than the bond between the indicia and the substrate, and

thereafter stripping the substrate away from the indicia.

4,234,674

AMINO-FUNCTIONAL PHOTOPOLYMER COMPOSITIONS AND PHOTO-OXIDATION IMAGING PROCESSES EMPLOYING SAME

James C. Woodbrey, Chesterfield, Mo., and Marlowe V. Moncur, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 866,133, Dec. 30, 1977, Pat. No. 4,188,223. This application Aug. 8, 1979, Ser. No. 64,978
Int. Cl.[3] G03C 11/12, 5/00, 1/68
U.S. Cl. 430—253 19 Claims

1. An imaging process comprising selectively exposing to electromagnetic radiation in the presence of ordinary molecular oxygen a film or layer of a photopolymer composition comprising an amino-functional photopolymer having two or more amino-functional groups per polymeric unit, said amino-functional groups comprising one selected from the group consisting of tertiary aliphatic amines, hindered secondary aliphatic amines, dialkyl aryl amines and combinations thereof, and

a photosensitizer capable of generating singlet molecular oxygen upon being subjected to electromagnetic radiation in the presence of ordinary molecular oxygen,

said photopolymer being capable of undergoing a photooxidation reaction when exposed to electromagnetic radiation in the presence of said photosensitizer and ordinary molecular oxygen to form a latent image in the exposed regions of said film or layer.

4,234,675
DRY FILM PHOTOSENSITIVE RESIST

Vladimir N. Kuznetsov, ulitsa Jubileinaya, 6, kv. 73, Istra Moskovskoi oblasti, U.S.S.R.

Continuation of Ser. No. 822,569, Aug. 8, 1977, abandoned. This application Feb. 28, 1979, Ser. No. 16,068
Claims priority, application U.S.S.R., Aug. 10, 1976, 2382553
Int. Cl.³ G03C 1/68
U.S. Cl. 430—271 **40 Claims**

1. A dry film photosensitive resist comprising a flexible laminated structure consisting of three layers: a first transparent polymer film transmitting UV radiation and having a thickness of 5–100μ; a second light-sensitive layer having a thickness of 5–1,000μ consisting essentially of:

(a) a carboxyl-containing polymer thickener consisting essentially of a water insoluble copolymer obtained by the polymerization of at least one carboxyl-containing monomer with at least one water insoluble monomer having a water solubility of less than 3 weight % at 20° C. and a pH of 7, the amount of carboxyl-containing monomer in the polymer ranging from 20 to 50 mol%;

(b) a hydroxyl-containing polar oligomer obtained through addition of an organic acid to at least one epoxy resin, said polar oligomer having a chain length of from 300 to 3,000 carbon units, and containing 4 to 8 weight % OH groups and wherein the number of residual epoxy groups in the polar oligomer ranges from zero to 10% of the initial number of epoxy groups;

(c) a monomeric substance having a boiling point above 200° C. at 760 mm Hg containing at least one fully substituted ester of a polyatomic alcohol with carboxylic acids, at least two hydroxyl groups of the polyatomic alcohol being substituted by residues of methacrylic and/or acrylic acid; the weight ratio of said polymer-thickener, polar oligomer, and monomeric substance in the light-sensitive layer being 100:15–100:15–100 respectively; a third layer comprising a polymeric film having a thickness of 5–100μ to form a protective layer for the light-sensitive layer and disposed thereon, all of the three layers being adhesively bonded together.

4,234,676
POLYTHIOL EFFECT CURABLE POLYMERIC COMPOSITION

Paul R. Hein, Marietta; James A. Evans, Atlanta, and Michael W. Yang, Marietta, all of Ga., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 23, 1978, Ser. No. 871,931
Int. Cl.² G03F 7/08; C33F 7/10
U.S. Cl. 430—286 **6 Claims**

1. The method of forming a printing plate which comprises

(A) Applying to a polyester film substrate in a coating thickness of about 2 to about 200 mils, a radiation curable composition comprising

(1) about 60 to about 95% by weight of said composition of C-C unsaturated acrylonitrile resin having a macromolecular structure and being a polyene having a weight average molecular weight of at least about 5,000;

(2) about 5 to about 30% by weight of said acrylonitrile resin of at least one monomer of an addition photopolymerizable polyethylenically unsaturated acrylic or methacrylic acid ester containing one or more acrylate or methacrylate groups per molecule or mixtures thereof having at least one photocrosslinkable C—C unsaturated bond;

(3) about 0.01 to about 10% by weight of said acrylonitrile resin of photoinitiator; and

(4) about 0.5 to about 10% by weight of said acrylonitrile resin of polythiol having the general formula R_8—$(-SH)_n$ where n is at least 2 and R_8 is a polyvalent organic moiety free from reactive carbon to carbon unsaturation, said polythiol being limited to an amount that will not basically change the curing properties of the combination of components (1), (2) and (3) of said radiation curable composition,

(B) Exposing to actinic radiation projected through an image-bearing transparency selected portion of said radiation curable composition for a time sufficient to cure said radiation curable composition in the exposed portions, and

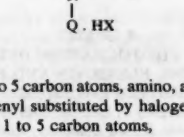
(C) Thereafter removing the unexposed radiation curable composition, forming a resilient printing plate that has a surface having a substantially reduced tack compared to a printing plate formed from the same composition except the polythiol.

4,234,677
PYRAZOLONE DYESTUFFS AND THEIR USE IN PHOTOGRAPHIC MATERIALS

Stephen R. Postle, Brentwood, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Jan. 22, 1979, Ser. No. 5,647
Claims priority, application United Kingdom, Jan. 26, 1978, 3110/78; Feb. 16, 1978, 6089/78
Int. Cl.³ C07D 231/08, 401/06, 403/06
U.S. Cl. 430—518 **13 Claims**

1. A dyestuff of the formula

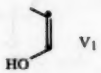


wherein,

R_1 is alkyl of 1 to 5 carbon atoms, amino, amido, hydroxyl or carboxyl, phenyl substituted by halogen, hydroxyl, alkyl or alkoxyl of 1 to 5 carbon atoms,

R_2 is -N= or =CH-(CH=CH)$_n$- where n is 0, 1 or 2 and

R_3 is 5-membered nitrogen-containing heterocyclic ring with 1 or 2 nitrogen atoms, a 6-membered nitrogen-containing heterocyclic ring with 1 nitrogen atom or these rings fused with a benzene ring, phenyl or phenyl substituted by halogen, hydroxyl, alkyl of 1 to 5 carbon atoms, carbalkoxyalkoxy with 1 to 5 carbon atoms in each alkoxy moiety or dialkylamino with 1 to 5 carbon atoms in each alkyl radical, R_3 is further a heterocyclic ring of the formula



wherein,

V_1 represents the atoms to complete a 5- or 6-membered nitrogen-containing heterocyclic ring with 1 or 2 nitrogen atoms or this ring substituted by hydroxyl, alkyl of 1 to 5 carbon atoms or cyano, and

Q is a group of the formula

wherein

W_1 and Y_1 are hydrogen or alkyl of 1 to 5 carbon atoms and X is an anion.

4,234,678

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Shinji Yoshimoto, Hachioji; Mitsuto Fujiwhara, Tokyo; Shoji Kikuchi, Hachioji; Ryosuke Satoh, Koganei; Takaya Endo, and Satoshi Nakagawa, both of Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1978, Ser. No. 962,793

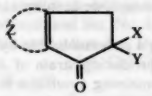
Claims priority, application Japan, Nov. 23, 1977, 52-140927

Int. Cl.[3] G03C *1/06*

U.S. Cl. 430—564 7 Claims

1. A photographic material comprising a light-sensitive silver halide emulsion layer coated on a support, which material is characterized by containing a compound represented by the following general formula [I]:

General formula [I]



wherein X represents hydrogen or halogen atom, Y represents a group capable of being released, when said compound of the general formula reacts with an oxidation product of a color developing agent, and of forming an arylmercapto compound, a heterocyclic mercapto compound or a triazole compound which has no mercapto group, each having a development inhibiting action, and Z represents a nonmetal atomic group necessary for forming a benzene ring, said benzene ring having been substituted by at least one —S—R group and/or a group having at least one —S—R group in which R represents an alkyl, aryl or heterocyclic group.

4,234,679

DRY IMAGE FORMING MATERIALS

Kageyasu Akashi; Yoshio Hayashi; Tatsumi Arakawa; Takeo Kimura, and Hidehiko Kobayashi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 12, 1978, Ser. No. 950,772

Claims priority, application Japan, Oct. 17, 1977, 52-123575

Int. Cl.[2] G03C *1/02*

U.S. Cl. 430—619 6 Claims

1. A dry image forming material comprising:
(a) an organic silver salt oxidizing agent;
(b) a photosensitive silver halide or a component capable of forming a photosensitive silver halide by the reaction with the organic silver salt oxidizing agent (a);
(c) a reducing agent for silver ion; and
(d) at least one compound selected from the group consisting of α,α,α′,α′-o-tetrabromoxylene, α,α,α′,α′-m-tetrabromoxylene, α,α,α′,α′-p-tetrabromoxylene, 1,2-diiodoethane and tribromoacetic acid.

4,234,680

METHOD FOR TERMINATING A PEROXIDASE CATALYZED REACTION

Richard C. Hevey, Rockport, Me.; Mark K. Malmros, Newton, Pa., and Wayne W. Petko, Bound Brook, N.J., assignors to Calbiochem-Behring Corp., La Jolla, Calif.

Filed Aug. 3, 1979, Ser. No. 63,178

Int. Cl.[3] C12Q *1/66, 1/28;* C12N *9/99*

U.S. Cl. 435—7 7 Claims

1. A method for terminating a peroxidase catalyzed reaction employed in a peroxidase-labeled enzyme immunoassay for detecting and quantitating ligands, said peroxidase catalyzed reaction comprising the oxidation of a substrate selected from the group consisting of o-phenylenediamine, m-phenylenediamine, dianisidine, aniline, p-aminobenzoic acid and m-aminosalicylic acid in the presence of a peroxide selected from the group consisting of hydrogen peroxide, methyl peroxide and ethyl peroxide, which method comprises adding to the enzyme immunoassay subsequent to the peroxidase catalyzed reaction an amount of alkali metal metabisulfite sufficient to terminate said reaction.

4,234,681

IMMOBOLIZED LIGHT EMITTING SYSTEMS

Marlene A. DeLuca-McElroy, La Jolla, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 750,436, Dec. 14, 1976, abandoned. This application Jul. 21, 1978, Ser. No. 926,642

Int. Cl.[3] C12Q *1/66;* C12N *11/18, 11/14, 11/10*

U.S. Cl. 435—8 7 Claims

1. A product useful for comprising: a non-reactive elongated rod having an insoluble enzyme retaining material attached thereto, said enzyme retaining material being porous glass beads; an oxidoreductase enzyme immobilized on said enzyme retaining material; and luciferase enzyme also immobilized on said enzyme retaining material.

4,234,682

METHOD AND REAGENT FOR DETERMINING BIOLOGICALLY ACTIVE HEPARIN IN PLASMA

Knut Bartl, Tutzing; Helmut Lill, Wielenbach, and Joachim Ziegenhorn, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,759

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812943

Int. Cl.[3] C12Q *1/38, 1/56*

U.S. Cl. 435—13 7 Claims

1. Method for the determination of the biological activity of heparin in plasma which method comprises
adding to the heparin sample a proteolytic enzyme selected from thrombin or factor Xa, and a chromogen substrate of said proteolytic enzyme, without addition of exogenous antithrombin III, and measuring the dye released from the chromogen substrate as a measure of the heparin activity initially present.

4,234,683

BETA-LACTAMASE DIAGNOSTIC PRODUCT AND METHOD

William A. McMillan, 2981 Magliocco Dr., Apt. 2, San Jose, Calif. 95128

Filed Nov. 24, 1978, Ser. No. 963,910

Int. Cl.[3] C12Q *1/34, 1/36, 1/04*

U.S. Cl. 435—18 20 Claims

1. A diagnostic product useful for sensitive, reproducible assays of microorganisms which produce beta-lactamase comprising:
a porous support on which is absorbed a substrate component, a starch component and a water-soluble thiosulfate component, the substrate component having a beta-lactamase ring.

4,234,684

METHOD OF PREPARING MYCOPHENOLIC ACID GLUCOSIDE

Bernard J. Abbott, Greenwood, and John G. Whitney, Noblesville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 11, 1979, Ser. No. 102,504

Int. Cl.[3] C12P *19/60*

U.S. Cl. 435—75 4 Claims

1. The method of producing mycophenolic acid glucoside which comprises contacting mycophenolic acid with glucose in the presence of a glucosylating enzyme selected from that produced by *Streptomyces candidus* NRRL 5449 and that produced by *Streptomyces aureofaciens* NRRL 2209 in an aqueous

medium until a substantial amount of mycophenolic acid glucoside is produced.

4,234,685

MICROBIOLOGICAL METHYLATION OF AMINOGLYCOSYL-AMINOGLYCOSIDES

Bong K. Lee; Gerald H. Wagman, both of East Brunswick; Dinanath F. Rane, Emerson; Joseph A. Marquez, Montclair, and Peter J. L. Daniels, Cedar Grove, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jun. 25, 1979, Ser. No. 51,790

Int. Cl.[3] C12P *19/48*

U.S. Cl. 435—80 **7 Claims**

1. A process for methylating certain aminoglycosyl aminocyclitols which comprises subjecting a member of the group consisting of tobramycin, kanamycin A, kanamycin B and dibekacin to *Micromonospora inyoensis* 1550F-1G or to *Micromonospora purpurea* strain 1124 in an aqueous nutrient medium containing an assimilable source of nutrients and an assimilable source of methionine, under aerobic conditions until methylation is substantially complete and recovering the corresponding 3''-N-methyl and the corresponding 3''-N-methyl-4''-C-methylanalogs of said aminoglycosyl aminocyclitols.

4,234,686

STARCH-DEGRADING ENZYMES DERIVED FROM *CLADOSPORIUM RESINAE*

James J. Marshall, Miami, Fla., assignor to Lifeline Products, Inc., Plainfield, N.J.

Continuation-in-part of Ser. No. 892,747, Apr. 3, 1978. This application Jun. 7, 1979, Ser. No. 46,482

Int. Cl.[2] C12P *19/24, 19/20, 19/16, 19/14*

U.S. Cl. 435—94 **8 Claims**

1. A method of producing dextrose from starch which comprises solubilizing starch to prepare a solution with a pH in the range from about 1.5 to about 8.5, contacting said solubilized starch with the mixture of starch-degrading enzymes selected from the group consisting of a mixture of starch-degrading enzymes prepared by culturing *Cladosporium resinae* (Strain ATCC No. 20 495) and an exo-pullulanase, a maltase, an α-amylase and glucoamylase S produced by *Cladosporium resinae* (Strain ATCC No. 20495) at a temperature in the range from about 30° C. to about 70° C. for a sufficient time so that said starch is substantially completely converted to dextrose, and recovering the dextrose so produced.

7. A method of producing fructose from starch which comprises the method of claim 1 wherein glucose isomerase is additionally present along with the mixture of starch-degrading enzymes.

4,234,687

β-GALACTOSIDASE

Stephen J. Bungard, and David Byrom, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sep. 9, 1977, Ser. No. 831,914

Claims priority, application United Kingdom, Sep. 19, 1976, 38002/76

Int. Cl.[3] C12P *19/14;* C12N *9/38;* C12R *1/01*

U.S. Cl. 435—99 **16 Claims**

1. A method for producing a composition selected from the group consisting of β-galactosidase enzyme and enzyme preparations containing β-galactosidase, comprising:

culturing a microorganism having the identifying characteristics of the microorganism LT-2 (NCIB No: 11259) capable of producing β-galactosidase, in a medium containing appropriate nutrients, and

recovering the β-galactosidase.

8. A method according to claim 1 wherein the medium contains as a carbon source a carbohydrate selected from the group consisting of lactose and galactose.

4,234,688

POLYSACCHARIDE PRODUCING PROCESS USING PROTEASE AND AZOTOBACTER

Renton C. Righelato, and Trevor R. Jarman, both of Reading, England, assignors to Tate & Lyle Limited, London, England

Filed Mar. 10, 1978, Ser. No. 885,272

Claims priority, application United Kingdom, Mar. 14, 1977, 10695/77

Int. Cl.[2] C12P *19/04;* C13L *3/00;* C12R *1/065*

U.S. Cl. 435—101 **9 Claims**

1. In a process for producing a polysaccharide by culturing a polysaccharide-producing strain of *Azotobacter vinelandii* in a culture broth containing a nutrient medium for said strain, the improvement which comprises regulating the solution viscosity of the polysaccharide product by incorporating in the culture broth during the culture a viscosity regulating effective amount of a protease having proteolytic activity at the pH of the culture broth.

6. In a process for producing a polysaccharide by culturing in a fermenter polysaccharide-producing strain of *Azotobacter vinelandii* in a culture broth containing a nutrient medium for said strain, and subsequently withdrawing the culture broth from the fermenter and storing the broth for a finite period before isolation of the polysaccharide product from the broth, the improvement which comprises conducting said culturing in the presence of a first amount of a protease having proteolytic activity at the pH of the culture broth and by adding to the culture broth, after it is withdrawn from the fermenter but before isolation of the polysaccharide product therefrom, second amount of said protease, said first and second amounts together being a solution viscosity regulating amount whereby the solution viscosity of the polysaccharide product is regulated.

4,234,689

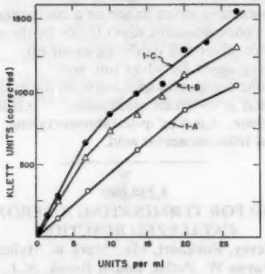
PRODUCTION OF α-EMULSANS

David L. Gutnick, Ramat Aviv; Eugene Rosenberg, Raanana, and Yossef Shabtai, Ramat Hasharon, all of Israel, assignors to Biotechnologie Aktiengesellschaft für Emulsan, Basel, Switzerland

Filed Feb. 22, 1979, Ser. No. 12,972

Int. Cl.[2] C12P *19/04*

U.S. Cl. 435—101 **21 Claims**



1. A process for producing extracellular microbial lipopolysaccharides which comprises (A) inoculating an aqueous fermentation medium containing a growth-sustaining amount of ethanol with a culture of Arthrobacter Sp. ATCC 31012 or its mutants; and (B) aerobically growing the microorganism in such fermentation medium, while adding additional amounts of ethanol to sustain growth, for a period of time sufficient to produce extracellular microbial protein-associated lipopolysaccharides (herein collectively called "α-emulsans") in which the lipopolysaccharide components (herein collectively called "apo-α-emulsans") of such α-emulsans are N- and O-lipoacylated heteropolysaccharides made up of major amounts

of D-galactosamine and an aminouronic acid, such apo- -emulsans containing at least 5 percent or above by weight of fatty acid esters in which (1) the fatty acids contain from about 10 to about 18 carbon atoms; and (2) about 50 percent by weight or more of such fatty acids are composed of 2-hydroxydodecanoic acid and 3-hydroxydodecanoic acid.

4,234,690

METHOD FOR PRODUCING ROSARAMICIN (ROSAMICIN)

Marvin J. Weinstein; Gerald H. Wagman, both of East Brunswick, and Joseph A. Marquez, Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 516,338, Oct. 21, 1974, Pat. No. 4,161,523, which is a continuation-in-part of Ser. No. 303,883, Nov. 15, 1972, abandoned, and Ser. No. 4,916, Jan. 22, 1970, abandoned. This application Jul. 16, 1979, Ser. No. 58,044

Int. Cl.[3] C12P *17/18*

U.S. Cl. 435—119 6 Claims

1. A process for the production of rosaramicin which comprises cultivating an rosaramicin producing strain of *Micromonospora rosaria* in an aqueous nutrient medium under submerged aerobic conditions until a composition of matter having substantial antibiotic activity is produced and isolating the composition of matter from said medium.

4,234,691

L-LYSINE α-OXIDASE

Hitoshi Kusakabe, Kyoto; Kenjiro Kodama, Choshi; Yuichiro Midorikawa, Choshi; Akira Kuninaka, Choshi; Haruo Misono, Hirakata, and Kenji Soda, Uji, all of Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Chiba, Japan

Filed Feb. 26, 1979, Ser. No. 15,179

Claims priority, application Japan, Feb. 27, 1978, 53/20993; Jun. 16, 1978, 53/73441

Int. Cl.[2] C12N *9/06*

U.S. Cl. 435—191 6 Claims

1. L-lysine α-oxidase which is an L-amino acid oxidase having an ability to form α-keto-ε-aminocaproic acid, ammonia and hydrogen peroxide from L-lysine by oxidative deamination of L-lysine in the presence of water and oxygen as well as having a very low Km value with respect to L-lysine and the high substrate-specificity with respect to L-lysine.

4,234,692

PREPARATION OF SULPHONIUM POLYMERS

Claude Favie, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Mar. 7, 1979, Ser. No. 18,170

Claims priority, application France, Aug. 3, 1978, 78 06723

Int. Cl.[3] C08F *08/34*

U.S. Cl. 521—33 14 Claims

1. A method of preparing a polymer the chain of which bears lateral branchings terminated by a sulfonium group and the chain of which has a hydroxyl group in the β position with respect to each of the sulfonium groups comprising the successive steps of:

(a) reacting an epoxy group containing polymer with a mercaptan in the presence of a basic substance as an oxirane bridge opening catalyst so as to convert a portion of the epoxy groups into sulfide groups;

(b) eliminating the residual epoxy groups from said sulfide group containing polymer by reaction thereof with a strong acid; and

(c) reacting the resulting sulfide containing polymer with an alkyl halide or alkyl ester in a non-acid medium so as to convert said sulfide groups into sulfonium groups.

4,234,693

PROCESS FOR MAKING POLYUREA FOAMS UTILIZING IMIDAZOLE CATALYSTS

Alan M. Wooler, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

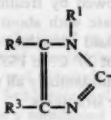
Filed Jun. 14, 1976, Ser. No. 695,413

Claims priority, application United Kingdom, Jun. 24, 1975, 26746/75

Int. Cl.[3] C08G *18/14, 18/20, 18/76*

U.S. Cl. 521—107 8 Claims

1. A process for the manufacture of polyurea foams which comprises reacting an organic polyisocyanate with from 1 to 10 times the chemically equivalent amount of water in the presence of from 0.5 to 10% by weight, based on the weight of organic polyisocyanate, of an imidazole compound of the formula:



wherein R^1, R^2, R^3 and R^4 each independently represents hydrogen or lower alkyl.

4,234,694

ADDITION COMPOUNDS WHICH CONTAIN PHOSPHORUS AND THEIR USE AS CATALYSTS FOR THE PRODUCTION OF FOAM RESINS WHICH CONTAIN CARBODIIMIDE GROUPS

Andrea La Spina, Saronno, Italy; Werner Dietrich, and Reinhard Schliebs, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 2,623, Jan. 8, 1979, abandoned, which is a continuation of Ser. No. 857,059, Dec. 5, 1977, abandoned, which is a continuation of Ser. No. 394,427, Sep. 4, 1973, abandoned. This application May 21, 1979, Ser. No. 41,124

Int. Cl.[3] C08G *18/14, 18/16*

U.S. Cl. 521—107 11 Claims

1. In a process for the production of hard foam resins which contain carbodiimide groups from polyisocyanates in the presence of catalysts which form carbodiimide groups and a blowing agent, in the absence of carboxylic acids and imide-forming catalysts, the improvement comprising employing catalysts consisting essentially of addition compounds comprising the reaction products of (a) phospholine oxides, and (b) mono-, di- and/or polyalcohols with a molecular weight of 32 to 250, wherein component (a) and component (b) are mixed in a molar ratio of 1:20 to 20:1 and wherein said catalysts are used in a quantity of 0.5 to 20% by weight, based on the quantity of polyisocyanate.

4,234,695

METHOD OF PRODUCING POLYUREA FOAMS

Toshio Yukuta; Takumi Ishiwaka, both of Yokohama, and Kiyoshi Usui, Kawasaki, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1979, Ser. No. 88,312

Claims priority, application Japan, Oct. 25, 1978, 53-131128; Oct. 25, 1978, 53-131129

Int. Cl.[3] C08J *9/02*

U.S. Cl. 521—107 10 Claims

1. A method of producing polyurea foams, which comprises reacting an organic polyisocyanate with water in the presence of urea.

4,234,696

2-CHLOROETHYL PHOSPHONATE COMPOSITIONS

Gail H. Birum, Kirkwood, and Richard F. Jansen, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 945,668, Sep. 25, 1978, Pat. No. 4,179,482, which is a continuation-in-part of Ser. No. 855,533, Nov. 28, 1977, abandoned, which is a continuation of Ser. No. 831,707, Sep. 9, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,581

Int. Cl.[3] C08G *18/14*

U.S. Cl. 521—108 3 Claims

1. The process of improving the tack-free and rise times in the production of a rigid polyurethane foam having flame retardant properties comprising incorporating in said polyurethane foam the composition prepared by the step-wise treatment of phosphorus trichloride with ethylene oxide in about stoichiometric proportions and at temperatures of from about −20° C. to 125° C. followed by treatment of the resulting phosphite ester intermediate with about 0.4 to 1.2 moles of acrylic acid per mole of said phosphite ester intermediate at temperatures of from about 20° C. to 150° C. and then heating up to about 185° C. until substantially all the phosphite ester is converted to phosphonate structures.

4,234,697

METHOD OF PREPARING CROSS-LINKED POLYDIORGANOSILOXANE USING ORGANIC ISOCYANATES AND PRODUCTS PREPARED THEREFROM

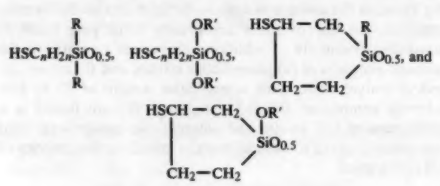
Gary R. Homan, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 18, 1979, Ser. No. 4,522

Int. Cl.[3] C08J *9/00*

U.S. Cl. 521—128 17 Claims

1. A method of preparing a sponge comprising combining a mercaptofunctional polydiorganosiloxane, an organic diisocyanate, and a catalyst such that a homogeneous mixture is formed, contacting the homogeneous mixture with water in the liquid state promoting foaming and cross-linking, and thereafter recovering a sponge, said mercapto-functional polydiorganosiloxane consisting essentially of a polydiorganosiloxane endblocked with organosiloxy units selected from units represented by unit formulae



wherein the polydiorganosiloxane has organic radicals selected from phenyl radicals and alkyl radicals of one to four inclusive carbon atoms, where at least 50 percent of the organic radicals of the polydiorganosiloxane are alkyl radicals, each R is phenyl radical or an alkyl radical of one to four inclusive carbon atoms, each R′ is an alkyl radical of one to three inclusive carbon atoms, n is an integer of from 2 to 4 inclusive, there being more than one mole of isocyanate group from the organic diisocyanate for each mole of mercapto group from the mercapto-functional polydiorganosiloxane, and there being at least one mole of water for each mole of isocyanate in excess of one mole of isocyanate group per mole of mercapto group.

14. A sponge obtained from the method of claim 1.

4,234,698

METHOD OF MAKING CURED AMINOPLAST FOAM

George Inverarity, West Midlands, and Dennis H. Ogden, Wolverhampton, both of England, assignors to British Industrial Plastics Limited, England

Filed Dec. 4, 1978, Ser. No. 966,242

Claims priority, application United Kingdom, Sep. 12, 1977, 51269/77

Int. Cl.[2] C08G *12/12, 12/14*

U.S. Cl. 521—188 5 Claims

1. In a method of making a cured foamed aminoformaldehyde product by

(a) dispersing a curing catalyst and a blowing agent in a liquid aminoformaldehyde precondensate to obtain a liquid foamable composition, and

(b) heating the composition to a temperature such as to cause the flowing agent to form a foam and the aminoformaldehyde precondensate to cure,

the improvement which consists in

(1) employing as the aminoformaldehyde precondensate one that has a water content less than 20% by weight and a viscosity in the range of about 400 to about 1300 poise at 25° C., and is obtained from a reaction mixture which consists essentially of urea, a source of formaldehyde selected from paraformaldehyde and hexamine, and a reaction modifier to maintain the reaction mixture in the liquid phase, said modifier being selected from ethylene urea, a melamine-formaldehyde precondensate, melamine, diethylene glycol, polyvinyl alcohol, a water-soluble carbohydrate, and dicyandiamide, and

(2) formulating the foamable composition so that, at the temperature at which foaming begins, its viscosity is in the range 100–1000 poise.

4,234,699

POLYMERIC LIGHT STABILIZERS FOR PLASTICS

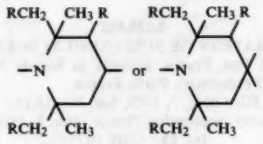
Jean Rody, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 896,676, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 793,708, May 4, 1977, abandoned. This application Nov. 29, 1978, Ser. No. 964,685

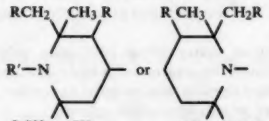
Int. Cl.[3] C08L *63/00*

U.S. Cl. 525—55 14 Claims

1. A polyether, the recurrent molecular unit of which contains a polyalkylpiperidine radical of the formula



or is substituted by a polyalkylpiperidine side group of the formula



in which R denotes hydrogen or alkyl with 1–5 C atoms and R′ denotes hydrogen, alkyl with 1–12 C atoms, alkenyl with 3–8 C atoms, alkinyl with 3–6 C atoms, aralkyl with 7–12 C atoms, alkanoyl with 1–8 C atoms or alkenoyl with 3–5 atoms.

4,234,700

POLYMERIC LIGHT STABILIZERS FOR PLASTICS

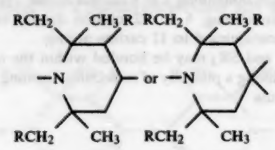
Jean Rody, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 896,676, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 793,708, May 4, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,044

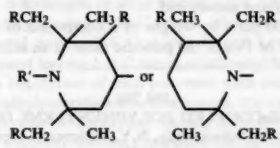
Int. Cl.[3] C08G *63/62*

U.S. Cl. 525—55 13 Claims

1. A polycarbonate, the recurrent molecular unit of which contains a polyalkylpiperidine radical of the formula



or is substituted by a polyalkylpiperidine side group of the formula



in which R denotes hydrogen or alkyl with 1–5 C atoms and R′ denotes hydrogen, alkyl with 1–12 C atoms, alkenyl with 3–8 C atoms, alkinyl with 3–6 C atoms, aralkyl with 7–12 C atoms, alkanoyl with 1–8 C atoms or alkenoyl with 3–5 C atoms, and a copolymer thereof with polyalkylpiperidine-free components.

4,234,701

COMPOSITIONS COMPRISING COPOLYMERS OF A VINYL AROMATIC COMPOUND AND AN UNSATURATED CYCLIC ANHYDRIDE AND IMPACT IMPROVERS

Visvaldis Abolins, Delmar, N.Y.; John C. Goossens, Mount Vernon, Ind.; Fred F. Holub, Schenectady, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 6, 1977, Ser. No. 839,905

Int. Cl.[3] C08L *61/04*

U.S. Cl. 525—68 8 Claims

1. A thermoplastic molding composition which comprises an intimate admixture of:

(a) a copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride, and

(b) an impact modifier consisting essentially of a graft copolymer comprising a vinyl aromatic compound and a diene rubber, alone, or in combination with an acrylonitrile, and

(c) a polyphenylene ether resin.

4,234,702

SILICONE RUBBER COMPOSITIONS

Akito Nakamura, Ichihara, Japan, assignor to Toray Silicone Company, Ltd, Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 22,576

Claims priority, application Japan, Apr. 21, 1978, 53/46465

Int. Cl.[3] C08L *9/06, 23/16, 33/06, 83/04*

U.S. Cl. 525—100 4 Claims

1. A composition of matter consisting essentially of

(a) 5–95 parts by weight of an unvulcanized rubber selected from the group consisting of

(i) natural rubber and

(ii) synthetic organic rubber;

(b) 5–95 parts by weight of an unvulcanized organopolysiloxane rubber wherein the silicon atoms in the organopolysiloxane rubber are attached to monovalent hydrocarbon radicals or substituted monovalent hydrocarbon radicals selected from a group consisting of methyl, vinyl, phenyl and 3,3,3-trifluoropropyl radicals and wherein at least 50 mol percent of all the hydrocarbon radicals are methyl;

(c) 1–30 parts by weight based on 100 parts by weight of components (a) and (b) of an organopolysiloxane having the average unit formula

$$R_aR'_bSiO_{\frac{4-a-b}{2}}$$

wherein R is a substituted or unsubstituted monovalent hydrocarbon radical selected from the group consisting of methyl, ethyl, vinyl, phenyl, naphthyl, β-phenylethyl, 2-phenylpropyl, 3-chloropropyl and 3,3,3-trifluoropropyl radicals and R′ is a substituted or unsubstituted aliphatic monovalent hydrocarbon radical of 4 to 20 carbon atoms, a has a value of 1 to 2.5 and b has a value of 0.01 to 1.2 and a+b has a value of 1.9 to 3;

(d) 0.1–15 parts by weight based on 100 parts by weight of components (a) and (b) of an organic peroxide.

4,234,703

POLYMER COMPOSITIONS AND A METHOD FOR ENHANCEMENT IN PHASE COMPATIBILITY OF ELASTOMERS WITH RELATIVELY RIGID POLYMERS

Geoffrey A. Lindsay, Hudson, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 11, 1978, Ser. No. 950,481

Int. Cl.[3] C08L *23/16*

U.S. Cl. 525—211 1 Claim

1. A thermoplastic composition consisting essentially of a relatively rigid chlorinated vinylchloride polymer having enhanced impact resistance at relatively low temperatures, said composition containing (a) from about 20 to about 70 weight percent chlorinated poly(vinylchloride), (b) from about 10 to about 50 weight percent EPM and/or EPDM type elastomer, said EPM and EPDM type elastomer having an ethylene content from about 60 to about 85 weight percent and (c) about 10 to about 60 weight percent chlorinated ethylene, chlorinated interpolymers of ethylene and/or poly(ethylene-co-vinylacetate).

4,234,704

CHLOROPRENE POLYMER COMPOSITION

Yasuhiro Sakanaka, and Mamoru Narui, both of Shin-Nanyo, Japan, assignors to Toyo Soda Manufacturing Company, Limited, Yamaguchi, Japan

Filed Jun. 14, 1979, Ser. No. 48,382

Claims priority, application Japan, Sep. 18, 1978, 53/113671

Int. Cl.[3] C08L *11/00*

U.S. Cl. 525—215 10 Claims

1. In a chloroprene polymer composition consisting essentially of a benzene soluble chloroprene polymer (A) and a gel chloroprene polymer (B) in a ratio ranging from 20:1 to 1:1, the improvement comprising: said benzene soluble chloroprene polymer (A) being obtained by the aqueous emulsion polymerization of chloroprene or a mixture of chloroprene and from 1 to 20 weight %, based on the total monomer content, of an ethylenically unsaturated or conjugated diene comonomer with 0.05 to 5.0 weight % of a molecular weight regulator, said polymerization occurring by polymerizing said chloroprene or chloroprene-monomer mixture in the presence of a quantity of said molecular weight regulator, less than said above indicated amount, sufficient to prevent gel formation during polymeriza-

tion until a conversion level of 40% to 60% is attained, and then adding to the partially polymerized reaction medium an additional quantity of molecular weight regulator in an amount of from 40% to 70% by weight the amount of molecular weight regulator originally mixed with the monomer and continuing said polymerization until a conversion in excess of 80% is attained; and the gel chloroprene polymer (B) being obtained by the aqueous emulsion polymerization of chloroprene or a mixture of chloroprene and from 0.1 to 10% by weight of an ethylenically unsaturated polyfunctional monomer.

4,234,705

CURABLE COMPOSITION OF HALOGEN-CONTAINING POLYMER AND CROSSLINKING AGENT THEREFOR

Yasuo Matoba, Toyonaka, Japan, assignor to Osaka Soda Co. Ltd., Osaka, Japan

Filed Sep. 26, 1979, Ser. No. 79,152

Claims priority, application Japan, Sep. 26, 1978, 53-118892

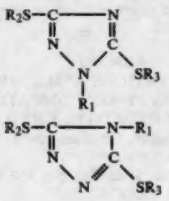
Int. Cl.[3] **C08J** *3/24;* **C08C** *19/32;* **C08F** *8/30;* **C08G** *65/32*

U.S. Cl. 525—329 **6 Claims**

1. A curable composition consisting essentially of

(1) 100 parts by weight of a halogen-containing polymer,

(2) 0.1 to 10 parts by weight of a 3,5-dimercapto-1,2,4-triazole compound as a crosslinking agent which is selected from compounds of the following formulae



(I)

(I')

wherein

R_1 represents a member selected from the class consisting of a hydrogen atom, alkyl groups containing 1 to 18 carbon atoms, cycloalkyl groups containing 5 to 18 carbon atoms, alkenyl groups containing 2 to 18 carbon atoms, aryl groups containing 6 to 18 carbon atoms and aralkyl groups containing 7 to 18 carbon atoms;

R_2 and R_3 are identical or different, and each represents a member selected from the class consisting of a hydrogen atom, a sodium atom, a potassium atom, groups of the formula

and groups of the formula

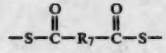
in which

R_4 and R_5 are identical or different and each represents a member selected from the class consisting of a hydrogen atom, alkyl groups containing 1 to 12 carbon atoms, cycloalkyl groups containing 5 to 12 carbon atoms, aryl groups containing 6 to 12 carbon atoms and aralkyl groups containing 7 to 18 carbon atoms, or R_4 and R_5 may form a heterocyclic ring in combination with each other, or through another heteroatom, and R_6 represents a member selected from the class consisting of alkyl groups containing 1 to 18 carbon atoms, cycloalkyl groups containing 5 to 18 carbon atoms, alkenyl groups containing 2 to 18 carbon atoms, aryl groups containing 6 to b 18 carbon atoms, aralkyl groups containing 7 to 18 carbon atoms and groups of the formula

in which

R_7 represents a member selected from the class consisting of alkylene groups containing 1 to 8 carbon atoms, alkenylene groups containing 1 to 8 carbon atoms, cycloalkylene groups containing 6 to 12 carbon atoms and arylene groups containing 6 to 12 carbon atoms;

and SR_2 and SR_3 may be bonded within the same molecule or among a plurality of molecules, forming a group of the formula



in which

R_7 is as defined above, and

(3) 0.5 to 50 parts by weight of a compound of a metal of group II or IVa of the periodic table as an acid acceptor.

4,234,706

QUINONE-COUPLED POLYPHENYLENE OXIDES

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

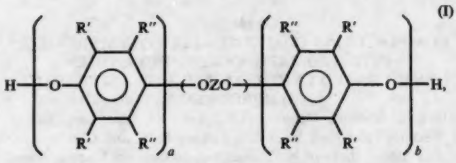
Filed May 26, 1977, Ser. No. 800,635

The portion of the term of this patent subsequent to Feb. 20, 1996, has been disclaimed.

Int. Cl.[3] **C08G** *65/44, 65/48*

U.S. Cl. 525—390 **8 Claims**

1. A quinone-coupled polyphenylene oxide of the formula



(I)

wherein independently each -(OZO)- is a divalent quinone residue, Z is a divalent arene radical, either a or b is at least equal to 1 and the sum of a plus b is at least equal to 10, R′ is hydrogen, a hydrocarbon radical, a halohydrocarbon radical having at least 2 carbon atoms between the halogen atoms and phenol nucleus, a hydrocarbonoxy radical, or a halohydrocarbonoxy radical having at least two carbon atoms between the halogen atoms and phenol nucleus, R″ being the same as R′ and, in addition, halogen.

4,234,707

POLYMERIC LIGHT STABILIZERS FOR PLASTICS

Jean Rody, Basel, and Erwin Nikles, Liestal, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 1, 1978, Ser. No. 956,715

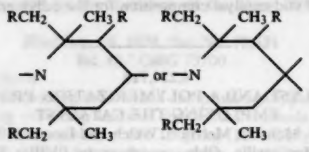
Claims priority, application Switzerland, Nov. 10, 1977, 13722/77

Int. Cl.[3] **C08G** *63/76*

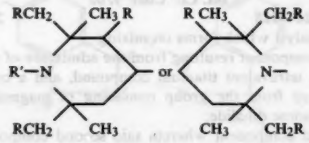
U.S. Cl. 525—437 **8 Claims**

1. A condensation or addition polymer selected from the group consisting of a polyester, polyamide, polyurethane, polyurea, polyether, polyamine or polyaminotriazine which

has blocked end groups and can be used as a light stabiliser and in which the recurring structural unit contains a polyalkylpiperidine residue of the formula



or is substituted by a polyalkylpiperidine side group of the formula



in which R is hydrogen or alkyl having 1–5 C atoms and R' is hydrogen, alkyl having 1–12 C atoms, alkenyl having 3–8 C atoms, alkynyl having 3–6 C atoms, aralkyl having 7–11 C atoms, alkanoyl having 1–8 C atoms or alkenoyl having 3–5 C atoms, or a copolymer of such polymers with one another or with a polyalkylpiperidine-free component, the end groups of the said polymer or copolymer having been blocked by the addition of a monofunctional compound during its preparation or by its subsequent reaction with a monofunctional compound.

8. A polymer according to claim 1 which is a polyester.

4,234,708

EXTRUSION GRADE POLYETHYLENE ISO/TEREPHTHALATE COPOLYMER

Robert Edelman, Staten Island, N.Y.; Frank M. Berardinelli, Millington, and Kurt F. Wissbrun, Short Hills, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 894,674, Apr. 10, 1978, Pat. No. 4,161,579. This application Apr. 23, 1979, Ser. No. 32,447

Int. Cl.[3] **C08G** *63/46, 63/76*

U.S. Cl. 525—444 **38 Claims**

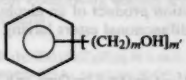
1. A high melt-strength, gel-free, branched polyethylene iso/terephthalate copolymer, capable of being extrusion blow molded to form shaped articles which are transparent throughout, comprising a polyethylene iso/terephthalate copolymer which has been modified by the incorporation of: (a) from about 0.025 to about 1.5 mol percent of chain branching agent selected from one or more members of the group consisting of pentaerythritol; compounds having the formula:

$$R^1(OH)_k$$

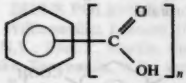
wherein R^1 is a saturated aliphatic hydrocarbon radical containing from 3 to 6 carbon atoms and k is an integer from 3 to 6; compounds having the formula:

$$R^2\text{-}(CH_2OH)_l$$

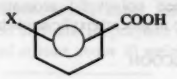
wherein R^2 is a saturated aliphatic hydrocarbon radical containing from 1 to 6 carbon atoms and wherein l is an integer from 3 to 6; compounds having the formula:



where m is an integer from 1 to 6 and m' is an integer from 3 to 6; and compounds having the formula:



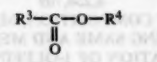
wherein n is an integer from 3 to 4; and (b) from about 0.25 to about 10 equivalents based on the number of moles of (a) of a chain terminating agent, the chain terminating agent having a boiling point of above about 200° C. and being stable at temperatures of up to about 305° C. and selected from one or more members of the group consisting of aromatic monocarboxylic acids having the formula:



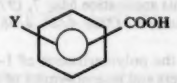
wherein X is a member selected from the group consisting of hydrogen, an aliphatic radical containing from 1 to 10 carbon atoms, an alkoxy group containing from 1 to 10 carbon atoms, an aryloxy group containing from 1 to 10 carbon atoms, a halogen, and a nitro group; heterocyclic aromatic monocarboxylic acids; fused polycyclic aromatic monocarboxylic acids; aryl aliphatic monocarboxylic acids having the formula:

$$(C_6H_5)_pCH_{3-p}COOH$$

where p is an integer from 1 to 3; substituted and unsubstituted, saturated and unsaturated aliphatic monocarboxylic acids having from 6 to 30 carbon atoms; substituted and unsubstituted alicyclic carboxylic acids having from 6 to 30 carbon atoms; monofunctional esters having the formula:



wherein R^3 is an organic radical derived from a member selected from the group consisting of aromatic monocarboxylic acids having the formula:

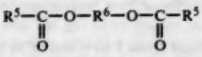


wherein Y is a member selected from the group consisting of hydrogen, an aliphatic radical containing from 1 to 10 carbon atoms, an alkoxy group containing from 1 to 10 carbon atoms, an aryloxy group containing from 1 to 10 carbon atoms, a halogen and a nitro group; heterocyclic aromatic monocarboxylic acids; fused polycyclic aromatic monocarboxylic acids; aryl aliphatic monocarboxylic acids having the formula:

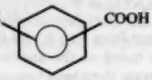
$$(C_6H_5)_qCH_{3-q}COOH$$

where q is an integer from 1 to 3; substituted and unsubstituted aliphatic monocarboxylic acids having from 6 to 30 carbon atoms; and substituted and unsubstituted alicyclic carboxylic acids having from 6 to 30 carbon atoms; and wherein R^4 is a

member selected from the group consisting of benzyl radicals and aliphatic radicals having from 1 to 18 carbon atoms; and which are the reaction product of an alcohol and a monocarboxylic acid; and difunctional esters having the formula:



wherein R^5 is an organic radical derived from a member selected from the group consisting of aromatic monocarboxylic acids having the formula:



wherein Z is a member selected from the group consisting of hydrogen, an aliphatic radical containing from 1 to 10 carbon atoms, an alkoxy group containing from 1 to 10 carbon atoms, an aryloxy group containing from 1 to 10 carbon atoms, a halogen, and a nitro group; heterocyclic aromatic monocarboxylic acids; fused polycyclic aromatic monocarboxylic acids; aryl aliphatic monocarboxylic acids having the formula:

$$(C_6H_5)_rCH_{3-r}COOH$$

wherein r is an integer from 1 to 3; substituted and unsubstituted, saturated and unsaturated aliphatic monocarboxylic acids having from 1 to 30 carbon atoms; and substituted and unsubstituted alicyclic carboxylic acids having from 6 to 30 carbon atoms; and wherein R^6 is a member selected from the group consisting of saturated aliphatic radicals having from 2 to 18 carbon atoms and saturated alicyclic radicals having from 5 to 18 carbon atoms; and which are the reaction product of a diol and a monocarboxylic acid; the modified polyethylene iso/terephthalate copolymer having a zero shear rate melt viscosity at a temperature in the range of from about 265° C. to about 300° C. of from about 10^5 to about 10^6 poise and a melt viscosity at a shear rate of about 10^3 seconds^{-1} and at a temperature in the range of from about 265° C. to about 300° C. of from about 10^3 to about 10^4 poise.

4,234,709

CATALYST COMPOSITION, METHOD FOR PRODUCING SAME AND METHOD FOR POLYMERIZATION OF 1-OLEFINS WITH SAME

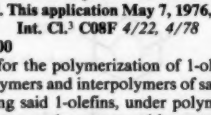
Louis J. Rekers, Wyoming, and Stanley J. Katzen, Cincinnati, Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Division of Ser. No. 532,131, Dec. 16, 1974, Pat. No. 3,985,676, which is a continuation-in-part of Ser. No. 436,263, Jan. 24, 1974, abandoned. This application May 7, 1976, Ser. No. 684,042

Int. Cl.³ C08F *4/22, 4/78*

U.S. Cl. 526—100 **13 Claims**

1. A process for the polymerization of 1-olefins to produce polymers, copolymers and interpolymers of said 1-olefins comprising contacting said 1-olefins, under polymerization conditions of temperature and pressure, with a catalyst composition comprising a solid inorganic support material having deposited thereon an organophosphoryl chromium product obtained from the reaction of chromium trioxide and an organophosphorus compound having the formula



wherein R is alkyl, aralkyl, aryl, cycloalkyl, or hydrogen, but at least one R group is other than hydrogen, said catalyst composition having been heated in a dry oxygen containing atmosphere at a temperature about about 400° F. and below the temperature at which the structure of the support is impaired for a period of time sufficient to promote the polymerization activity of said catalyst composition for the polymerization of 1-olefins.

4,234,710

CATALYST AND A POLYMERIZATION PROCESS EMPLOYING THE CATALYST

Charles W. Moberly; Melvin B. Welch, and Lawrence M. Fodor, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 598,965, Jul. 24, 1975, abandoned. This application Jul. 8, 1976, Ser. No. 703,473

Int. Cl.³ C08F *4/02*

U.S. Cl. 526—125 **26 Claims**

1. A catalyst which forms on mixing:

a first component resulting from the admixture of a halogenated tetravalent titanium compound, and a compound selected from the group consisting of magnesium and manganese dihalide;

a second component wherein said second component is a compound selected from the group consisting of a trialkylaluminum compound and an organoaluminum compound having two or more aluminum atoms bonded to one another by an oxygen or a nitrogen atom;

a third component wherein said third component is a Lewis base; and

a fourth component wherein said fourth component is an organoaluminum monohalide represented by the general formula AlR_2X wherein the R groups represent alkyl radicals having from 1 to about 12 carbon atoms, said R groups being the same or different, and X represents a halogen atom;

wherein the mole ratio of the second component to the Lewis base of the third component ranges from about 1.5:1 to about 6.0:1, wherein the molar ratio of the aluminum compound of the second component to the titanium compound ranges from about 25:1 to about 1500:1 and wherein the molar ratio of the aluminum compound of the fourth component to the titanium compound ranges from about 2:1 to about 1500:1.

4,234,711

ANAEROBIC ADHESIVE AND/OR SEALING COMPOSITIONS COMPRISING DICYCLOPENTENYLOXYETHYL (METH)ACRYLATES

William D. Emmons, Huntingdon Valley, and Vincent J. Moser, Hatboro, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 9, 1978, Ser. No. 932,256

Int. Cl.³ C08F *4/34;* C09D *3/80;* C08F *236/00*

U.S. Cl. 526—282 **10 Claims**

1. A spreadable fluid adhesive and/or sealing composition hardenable under exclusion of oxygen comprising, as its essential components:

(a) Liquid dicyclopentenyloxyethyl acrylate or methacrylate, or a mixture thereof as the main component,

(b) From 0 to 0.1% by weight of a polymerization inhibitor serving to stabilize the composition while stored in the presence of oxygen,

(c) From about 0.1 to 20% by weight of an organic percompound having 3 to 18 carbon atoms selected from the group consisting of organic peroxides, which are half-decomposed after 10 hours at temperatures above 90° C., and organic hydroperoxides as a polymerization initiator, effective under exclusion of oxygen, and

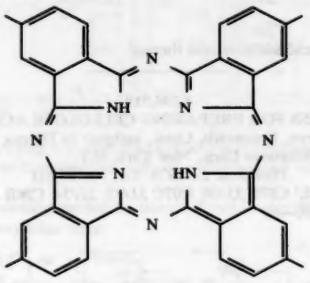
(d) From about 0.1 to 5% by weight of an accelerator, the aforesaid percentages being based on the total weight of the components (a), (b), (c) and (d).

4,234,712
POLYPHTHALOCYANINE RESINS

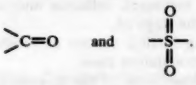
Teddy M. Keller, Alexandria, Va., and James R. Griffith, Riverdale Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1979, Ser. No. 75,631
Int. Cl.[3] C08G 73/00
U.S. Cl. 528—9 **6 Claims**

1. A thermosetting resin which comprises a polyphthalocyanine having recurring units of the general formula selected from the class consisting of ($PcO_4R_2Ph_4$) ($M.PcO_4R_2Ph_4$) and ($MXPcO_4R_2Ph_4$) wherein Pc represents the phthalocyanine nucleus having the formula:



Ph represents the phenyl group, M is selected from the class consisting of chromium, molybdenum, vanadium, beryllium, silver, mercury. aluminum, tin, lead, antimony, calcium, barium, manganese, magnesium, zinc, copper, iron, cobalt, nickel, palladium, platinum, and mixtures thereof, MX is selected from cuprous chloride, cuprous bromide, cuprous cyanide, cuprous ferricyanide, zinc chloride, zinc bromide, zinc iodide, zinc cyanide, zinc ferrocyanide, zinc acetate, zinc sulfide, silver chloride, ferrous chloride, ferric chloride, ferrous ferricyanide, ferrous chloroplatinate, ferrous fluoride, ferrous sulfate, cobaltous chloride, cobaltic sulfate, cobaltous cyanide, nickel chloride, nickel cyanide, nickel sulfate, nickel carbonate, stannic chloride, stannous chloride hydrate, a complex of triphanylphosphine oxide and stannous chloride and mixtures thereof, and R is selected from the class consisting of



4,234,713
CURABLE SOLVENTLESS ORGANOPOLYSILOXANE COMPOSITIONS

Gary E. LeGrow, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 912,794, Jun. 5, 1978, abandoned. This application May 29, 1979, Ser. No. 42,831
Int. Cl.[3] C08G 77/06
U.S. Cl. 528—15 **7 Claims**

1. An improved curable composition consisting essentially of a mixture of

(a) an organopolysiloxane containing from 67 to 85 mol percent $C_6H_5SiO_{3/2}$ units and 33 to 15 mol percent of $CH_2{=}CH(CH_3)_2SiO_{1}$ units, said organopolysiloxane having an average of at least 8 silicon atoms per molecule;

(b) a silicon hydride containing polysiloxane crosslinker for (a), said (b) being present in an amount sufficient to provide about 0.9 to 1.1 mol of silicon hydride per mol of $CH_2{=}CHSi$ present in (a) and (d);

(c) a platinum catalyst in an amount sufficient to catalyze the reaction of the silicon hydride with the $CH_2{=}CHSi—$; the improvement comprising adding a reactive diluent (d) having the formula

$\{CH_2{=}CH(CH_3)_2SiO\}_2Si(C_6H_5)_2$ in a ratio of 1:4 to 1:1 of component (d) to component (a).

4,234,714
PREPARATION OF SINGLE-PHASE, URETHANE PREPOLYMERS FROM HYDROXY-TERMINATED DIENE POLYMERS

Mason H. Earing, Williamsville; Leonard H. Gielinski, West Seneca, both of N.Y.; Paul F. Martin, Fairfield, Ohio, and Glenn H. Petschke, Tonawanda, N.Y., assignors to Textron Inc., Providence, R.I.

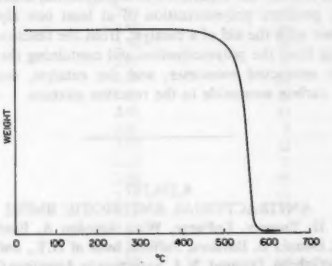
Filed Mar. 29, 1979, Ser. No. 25,046
Int. Cl.[3] C08G 18/08; C07C 125/077; C08G 18/62
U.S. Cl. 528—67 **18 Claims**

1. A process for preparing urethane prepolymers resistant to the formation of multiple phases or layers upon storage which comprises reacting a viscous, normally liquid hydroxy-terminated polymer of conjugated diene of 4 to 8 carbon atoms and normally liquid, relatively non-volatile, aromatic polyisocyanate at a temperature above about 150° C. to form an isocyanate-terminated urethane prepolymer having an isocyanate group content of at least about 10 weight percent.

4,234,715
PERFLUOROALKYL POLYTRIAZINES CONTAINING PENDENT IODODIFLUOROMETHYL GROUPS

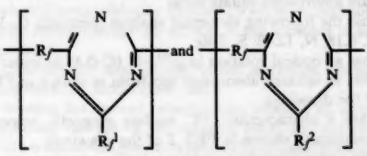
Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Robert W. Rosser, San Jose, Calif., and Theodore Psarras, Gainesville, Fla.

Filed May 8, 1979, Ser. No. 37,066
Int. Cl.[3] C08G 63/44
U.S. Cl. 528—362 **4 Claims**



THERMOGRAVIMETRIC ANALYSIS OF THE CURED PRODUCT OF EXAMPLE 3. SAMPLE WEIGHT: 17.25 mg; ATMOSPHERE: N_2; HEATING RATE: 10 °C/min.

1. A linear polytriazine curable to a crosslinked elastomer and consisting of randomly distributed repeating units of the formula



wherein:

(a) R_f represents identical bivalent perfluorinated organic

radicals or any combination of bivalent perfluorinated organic radicals, said radicals being selected from the group consisting of $-(CF_2)_p-$ in which p ranges from 2 to 18, and oligomeric or polymeric radicals prepared by the reaction of a perfluorinated dicarboxylic acid halide with a perfluoroepoxide and having the formula

$$-CFY(OCF_2CFY)_mO(CF_2)_pO(CFYCF_2O)_n-$$
$$CFY-$$

wherein Y is a fluorine atom or a trifluoromethyl group, p ranges from 2 to 18, and m+n ranges from 2 to 7;

(b) R_f^1 represents a monovalent perfluoro radical selected from the group consisting of (1) monovalent perfluorinated alkyl radicals containing up to 11 carbon atoms, (2) monovalent perfluorinated alkylether radicals having the formula $R_f^4O(CFYCF_2)_yCFY-$ in which R_f^4 is a perfluorinated alkyl group containing up to 3 carbon atoms, Y is a fluorine atom or a trifluoromethyl group, and y ranges from 0 to 50, and (3) mixtures thereof;

(c) R_f^2 is a monovalent ω-iodoperfluoro radical selected from the ω-iodo substituted homologs of R_f^1; and

(d) the number of iodine-containing randomly distributed triazine repeating units constitutes from about 1 to 100% of all repeating units in the linear polytriazine compound.

4,234,716
PROCESS FOR THE SEPARATION OF POLYOLEFINS MANUFACTURED AT LOW PRESSURE

Herve Cuypers, Cerouxmoousty, and Paul Baekelmans, Genval, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Sep. 12, 1978, Ser. No. 941,671
Claims priority, application France, Sep. 12, 1977, 77 27700
Int. Cl.³ C08F *6/02*
U.S. Cl. 528—483 **12 Claims**

1. Process for the separation of a polyolefin, manufactured by low pressure polymerization of at least one alpha-olefin monomer with the aid of a catalyst, from the reaction mixture resulting from the polymerization and containing the polyolefin, the unreacted monomer, and the catalyst, comprising: adding carbon monoxide to the reaction mixture.

4,234,717
ANTIBACTERIAL ANTIBIOTIC BM782

Homer D. Tresner, LaFarge, Wis.; Amedeo A. Fantini, New City; Donald B. Borders, Suffern, both of N.Y., and William J. McGahren, Dumont, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 891,572, Mar. 30, 1978, abandoned. This application Mar. 2, 1979, Ser. No. 17,000
Int. Cl.³ A61K *31/71;* C07H *15/22*
U.S. Cl. 536—17 R **3 Claims**

1. Antibiotic BM782α1 which

(a) is effective as an antibacterial agent; and in its essentially pure amorphous sulfate form;

(b) has the following elemental analysis (percent): C, 31.79; H, 6.18; N, 12.48; S, 7.40;

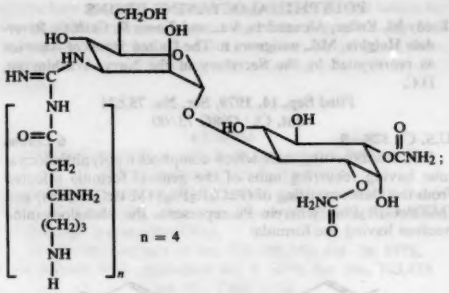
(c) has an optical rotation $[\alpha]_D^{20}=0°$ (C–0.48 in water);

(d) has an infrared absorption spectrum as shown in FIG. 1 of the drawings;

(e) has a characteristic ^{13}C nuclear magnetic resonance spectrum as shown in FIG. 2 of the drawings;

(f) has a characteristic proton magnetic resonance spectrum as shown in FIG. 3 of the drawings; and

(g) has a structure of

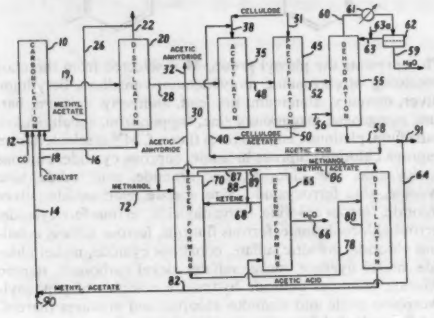


and acid-addition salts thereof.

4,234,718
PROCESS FOR PREPARING CELLULOSE ACETATE

David Brown, Greenwich, Conn., assignor to Halcon Research and Development Corp., New York, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,611
Int. Cl.³ C07B *53/08;* C07C *51/15, 51/54;* C08B *3/06*
U.S. Cl. 536—69 **6 Claims**



1. A cyclic integrated process for the preparation of cellulose acetate from methanol, cellulose and carbon monoxide which comprises the steps of:

(1) carbonylating methyl acetate to produce acetic anhydride in a carbonylation zone;

(2) reacting at least some of the so-produced acetic anhydride with cellulose to convert at least part of said acetic anhydride to cellulose acetate and acetic acid;

(3) converting said acetic acid to ketene;

(4) reacting said ketene with methanol in an ester-forming zone to form methyl acetate for step (1); and

(5) introducing methyl acetate produced in step (4) into said carbonylation zone.

4,234,719
PREPARATION OF CELLULOSE ACETATE

Chee-Gen Wan, North Brunswick, N.J., assignor to Halcon Research and Development Corp., New York, N.Y.

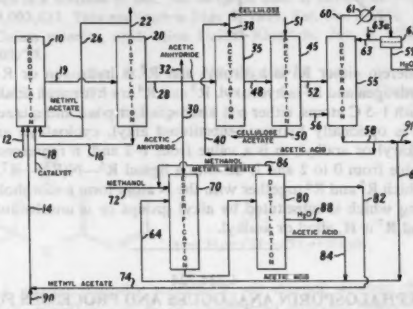
Continuation-in-part of Ser. No. 866,089, Dec. 30, 1977. This application Jun. 29, 1979, Ser. No. 53,612
Int. Cl.³ C07B *53/08;* C07C *51/15, 51/54;* C08B *3/06*
U.S. Cl. 536—69 **5 Claims**

1. A cyclic integrated process for the preparation of cellulose acetate from methanol, cellulose and carbon monoxide which comprises the steps of:

(1) carbonylating methyl acetate to produce acetic anhydride in a carbonylation zone;

(2) reacting at least some of the so-produced acetic anhydride with cellulose to convert at least part of said acetic anhydride to cellulose acetate and acetic acid;

(3) dehydrating said acetic acid by removing at least a portion of the water therefrom;



(4) esterifying said dehydrated acetic acid with methanol in an esterification zone to form methyl acetate for step (1); and

(5) introducing methyl acetate produced in step (4) into said carbonylation zone.

4,234,720

PROSTAGLANDIN DERIVATIVES

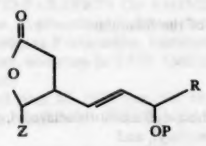
Andre G. Pernet, Montreal, Canada; Hiromasa Nakamoto, and Naoyasu Ishizuka, both of Toyama, Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 746,021, Nov. 30, 1976, abandoned, which is a division of Ser. No. 647,822, Jan. 9, 1976, abandoned. This application Apr. 26, 1978, Ser. No. 899,904

Int. Cl.³ C07D *307/20, 407/12*

U.S. Cl. 542—413 **7 Claims**

1. A compound of the formula



wherein R is a linear, branched or cyclic alkyl group of 3–7 carbons, P is a protective group that can be removed chemically without affecting the rest of the molecule, and Z is OP, CH_3 or CH_2OP.

4,234,721

PROCESS FOR THE PREPARATION OF THE CRYSTALLINE MONOHYDRATE OF 7-[D-AMINO-(P-HYDROXYPHENYL]ACETAMIDO)-3-METHYL-3-CEPHEN-4-CARBOXYLIC ACID

Daniel Bouzard, Franconville; Abraham Weber, and Jacques Stemer, both of Paris, all of France, assignors to Bristol-Myers Company, New York, N.Y.

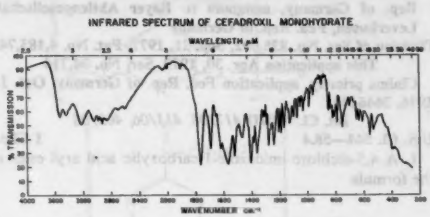
Division of Ser. No. 874,457, Feb. 2, 1978, Pat. No. 4,160,863, which is a division of Ser. No. 785,392, Apr. 7, 1977, abandoned. This application May 21, 1979, Ser. No. 71,951

Claims priority, application United Kingdom, Apr. 27, 1976, 17028/76

Int. Cl.³ C07D *501/02, 501/12, 501/22*

U.S. Cl. 544—30 **17 Claims**

1. A process for the preparation of crystalline 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid monohydrate exhibiting essentially the following x-ray diffraction properties:



Line	Spacing d(A)	Relative Intensity
1	8.84	100
2	7.88	40
3	7.27	42
4	6.89	15
5	6.08	70
6	5.56	5
7	5.35	63
8	4.98	38
9	4.73	26
10	4.43	18
11	4.10	61
12	3.95	5
13	3.79	70
14	3.66	5
15	3.55	12
16	3.45	74
17	3.30	11
18	3.18	14
19	3.09	16
20	3.03	29
21	2.93	8
22	2.85	26
23	2.76	19
24	2.67	9
25	2.59	28
26	2.51	12
27	2.46	13
28	2.41	2
29	2.35	12
30	2.30	2
31	2.20	15
32	2.17	11
33	2.12	7
34	2.05	4
35	1.99	4
36	1.95	14
37	1.90	10

which process comprises

(a) silylating 7-aminodesacetoxycephalosporanic acid in an inert substantially anhydrous aprotic solvent;

(b) acylating the so-produced silylated 7-aminodesacetoxycephalosporanic acid with D(−)-α-amino-α-(p-hydroxyphenyl)acetyl chloride hydrochloride in an inert substantially anhydrous aprotic solvent in the presence of an acid acceptor;

(c) cleaving any silyl groups of the acylation product by hydrolysis or alcoholysis; and

(d) forming the desired monohydrate product by upwardly adjusting the pH of the solution from step (c) to form 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid and contacting said acid with water or a partially aqueous medium to effect crystallization of the desired monohydrate.

4,234,722
4,5-DICHLORO-IMIDAZOLE-1-CARBOXYLIC ACID ARYL ESTERS

Klaus Sasse, Berg. Gladbach; Gunther Beck; Ludwig Eue, both of Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

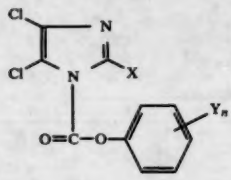
Division of Ser. No. 835,092, Sep. 21, 1977, Pat. No. 4,183,742. This application Apr. 30, 1979, Ser. No. 34,714

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646143

Int. Cl.³ C07D *417/06, 413/06, 403/06*

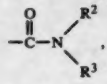
U.S. Cl. 544—58.4 **1 Claim**

1. A 4,5-dichloro-imidazole-1-carboxylic acid aryl ester of the formula



(I)

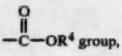
in which X represents a group



in which

R^2 and R^3 conjointly with the adjoining nitrogen atom form a morpholine, thiamorpholine or piperazine ring,

Y represents halogen, alkyl with 1 to 6 carbon atoms, trifluoromethyl, alkoxy with 1 to 6 carbon atoms, alkylmercapto with 1 to 6 carbon atoms, nitro, cyano or a



group,

in which

R^4 represents alkyl with 1 to 6 carbon atoms and n represents 0, 1, 2, 3, 4 or 5.

4,234,723
NICKEL STABILIZERS FOR SYNTHETIC POLYMERS

Michael Rasberger, Allschwil; Jean Rody, Basel; Paul Moser, Riehen, and Helmut Müller, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

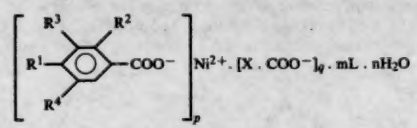
Division of Ser. No. 827,293, Aug. 24, 1977, Pat. No. 4,186,267, which is a division of Ser. No. 663,332, Mar. 3, 1976, Pat. No. 4,046,788, which is a division of Ser. No. 491,978, Jul. 26, 1974, Pat. No. 3,948,852. This application Jul. 30, 1979, Ser. No. 62,448

Claims priority, application Switzerland, Aug. 7, 1973, 11407/73; Jan. 28, 1974, 1103/74

Int. Cl.³ C07F *15/04*

U.S. Cl. 544—64 **5 Claims**

1. A compound of the formula I



(I)

wherein either R^1 is hydroxyl and R^2 is hydrogen or R^1 is hydrogen and R^2 is hydroxyl, R^3 and R^4 are hydrogen or alkyl with 1–5 C atoms, either p is 1 and q is 1 or p is 2 and q is zero, X is optionally hydroxyl-substituted alkyl, cycloalkyl, aryl, alkaryl or aralkyl, m is a value from 1–2 and, n represents a value from 0 to 2 and L denotes a ligand R^5—N(R^6)—R^7, in which R^5 and R^6 together with the N atom form a morpholine ring which is substituted by alkyl groups or is unsubstituted and R^7 is H, alkyl or aralkyl.

4,234,724
CEPHALOSPORIN ANALOGUES AND PROCESSES FOR THE PREPARATION THEREOF

Masashi Hashimoto, Takarazuka; Keiji Hemmi, Kyoyo; Matsuhiko Aratani, Osaka; Hidekazu Takeno, Nara, and Daijiro Hagiwara, Moriguchi, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

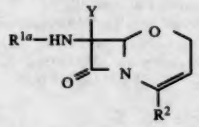
Filed Dec. 22, 1978, Ser. No. 972,382

Claims priority, application United Kingdom, Dec. 23, 1977, 53735/77; Jun. 16, 1978, 27116/78

Int. Cl.³ C07D *498/04*

U.S. Cl. 544—90 **23 Claims**

1. A compound of the formula:



(Ia)

wherein

R^{1a} is a group of the formula:

R^3-A-CO-

in which

R^3 is aminothiazolyl, aminothiadiazolyl, aminopyridyl or aminopyrimidinyl, and

A is

lower alkoxyiminomethylene,

lower alkenyloxyiminomethylene,

lower alkynyloxyiminomethylene or

phenyl(lower)alkoxyiminomethylene;

R^2 is carboxy or a protected carboxy; and

Y is hydrogen or lower alkoxy, and pharmaceutically acceptable salts thereof.

4,234,725
4-[6-(2-CHLORO-4-METHOXYPHENOXY)HEXYL]-3,5-DIETHYL-1-[4-(4-MORPHOLINYL)-1-OXOBUTYL]-1H-PYRAZOLE

Guy D. Diana, Stephentown, and Philip M. Carabateas, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 8,412, Feb. 1, 1979, which is a division of Ser. No. 822,246, Aug. 5, 1977, Pat. No. 4,171,365. This application Oct. 24, 1979, Ser. No. 87,879

Int. Cl.³ C07D *413/06*

U.S. Cl. 544—140 **1 Claim**

1. 4-[6-(2-Chloro-4-methoxyphenoxy)hexyl]-3,5-diethyl-1-[4-(4-morpholinyl)-1-oxobutyl]-1H-pyrazole.

4,234,726
HETEROCYCLIC CONTAINING CHROMANS

Derek V. Gardner, Bishop Stortford, England, assignor to Beecham Group Limited, England

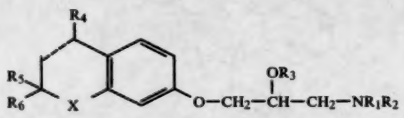
Continuation of Ser. No. 852,744, Nov. 18, 1977, abandoned, which is a division of Ser. No. 691,865, Jun. 1, 1976, Pat. No. 4,093,631. This application May 9, 1979, Ser. No. 37,958

Claims priority, application United Kingdom, Jun. 3, 1975, 24005/75

Int. Cl.³ C07D *413/12, 405/12*

U.S. Cl. 544—151 **23 Claims**

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof wherein the NR_1R_2 moiety is a 5-, 6-, or 7-membered saturated heterocyclic ring; R_3 is hydrogen, alkyl of 1 to 4 carbon atoms or acyl of 1 to 4 carbon atoms; R_4 is naphthyl or phenyl unsubstituted or substituted by one or two substituents selected from the group consisting of fluorine, chlorine, bromine, methoxyl, benzyloxyl, trifluoromethyl, methyl, cyano, nitro, acetoxyl, amino, methylamino, ethylamino, dimethylamino, diethylamino, acetamido, hydroxyl, methoxycarbonyl, ethoxycarbonyl, carboxamido, sulphonamido, carboxy, trifluoromethylthio, trifluoromethoxyl, methylsulphonyl, trifluoromethylsulphonyl and methylthio; R_5 is hydrogen or alkyl of 1 to 4 carbon atoms; R_6 is hydrogen or alkyl of 1 to 4 carbon atoms; X is oxygen and the dotted line represents a single or double bond.

4,234,727
PREPARATION OF AMINES

Herbert Toussaint, Frankenthal; Wolfgang Schroeder, Bad Durkheim, and Wolfgang Franzischka, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,742

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838184

Int. Cl.³ C07C *85/06, 85/08;* C07D *241/04, 295/02*

U.S. Cl. 544—178 **2 Claims**

1. A process for N-alkylating an amine by reacting it with an alcohol or carbonyl compound in the gas phase over a copper catalyst under hydrogenating conditions, wherein the reaction is carried out over a copper catalyst which has been obtained by thermal decomposition and reduction of a basic copper-aluminum carbonate.

4,234,728
POLYALKYLPIPERIDINE DERIVATIVES OF S-TRIAZINE

Jean Rody, Riehen, and Godwin Berner, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

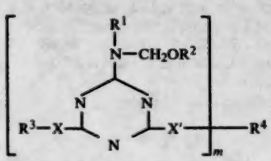
Filed Dec. 21, 1978, Ser. No. 972,146

Claims priority, application Switzerland, Dec. 30, 1977, 16297/77; Aug. 31, 1978, 9199780/78

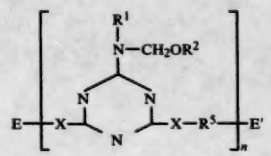
Int. Cl.³ C07D *251/46, 251/52, 251/64, 401/12*

U.S. Cl. 544—198 **9 Claims**

1. A compound of the formula I or II

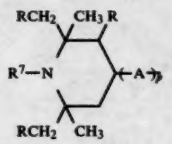


I



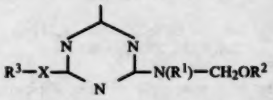
II

in which m is an integer from 1 to 4 and n is a value from 2 to 50, X and X' are —O—, —S— or —NR^6—, in which R^6 is hydrogen, C_1–C_{18} alkyl, C_3–C_8 alkenyl, C_1–C_4 hydroxyalkyl, C_2–C_{13} alkoxyalkyl, C_5–C_{12} cycloalkyl, C_6–C_{10} aryl, C_7–C_9 phenylalkyl, or a polyalkylpiperidine group of the formula III



III

in which R is hydrogen or methyl, p is 0 or 1, A is C_1–C_4-alkylene, —NR^6—C_2–C_{12}-alkylene- or —$OCH_2CH_2CH_2$— and R^7 is H, O, C_1–C_{12}-alkyl, allyl, benzyl or a —CH_2—CH(R^8)—OH group, in which R^8 is H, CH_3, C_2H_5 or phenyl, and R^1 and R^3 are hydrogen, C_1–C_{18} alkyl, C_3–C_8 alkenyl, C_1–C_4 hydroxyalkyl, C_2–C_{13} alkoxyalkyl, C_5–C_{12} cycloalkyl, C_6–C_{10} aryl, C_7–C_9 phenylalkyl, phenyl or phenylalkyl which is substituted by one or more substituents from the group consisting of C_1–C_8 alkyl, OH, C_1–C_4 alkoxy, and a polyalkylpiperidine group of the formula III, R^2 is hydrogen, C_1–C_{18} alkyl, C_3–C_8 alkenyl, C_2–C_6 hydroxyalkyl or C_3–C_6 alkoxyalkyl, R^4, if m is 1, is hydrogen, C_1–C_{18} alkyl, C_3–C_8 alkenyl, C_2–C_4 hydroxyalkyl, C_3–C_6 alkoxyalkyl, C_6–C_{10} aryl, C_7–C_9 phenylalkyl, phenyl or phenylalkyl which is substituted by one or more substituents from the group consisting of C_1–C_8 alkyl, OH, C_1–C_4 alkoxy, and a polyalkylpiperidine group of the formula III, and, if m is 2, C_2–C_{12} alkylene or oxaalkylene, C_4–C_{12} alkenylene, C_6–C_{10} arylene, a -phenylene-Z-phenylene- radical, in which Z is —O—, —S—, —SO_2—, —CH_2— or —$C(CH_3)_2$—, or a radical of the formula —$(CH_2)_r$—N(Y)—$(CH_2)_r$—N(Y)]$_q$$(CH_2)_r$—, wherein r is 2 or 3 and q is 0 or 1 and Y is a triazinyl group of the formula IV,



IV

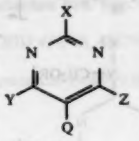
and, if m is 3, is a R^8—$C(CH_2—)_3$ radical, in which R^8 is C_1–C_4 alkyl, and, if m is 4, is a $C(CH_2—)_4$ radical, R^5 is C_2–C_{12} alkylene and E is hydrogen, alkyl or HX—R^5— and E' is XH and at least one of the radicals R^1, R^3, R^4, or R^6 is a polyalkylpiperidine of the formula III.

4,234,729
PHOSPHINE OXIDE-SUBSTITUTED PYRIMIDINES

Joseph J. Mrowca, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 18, 1979, Ser. No. 49,481
Int. Cl.[3] C07F 9/65; C08K 5/53
U.S. Cl. 544—243 7 Claims

1. Phosphine oxide of the formula



wherein

X is H, alkylthio of 1–4 carbon atoms, or

Y is H, alkyl of 1–4 carbon atoms, Cl, Br, or

Z is H, alkyl of 1–4 carbon atoms, or

at least one of X, Y, and Z is

Q is H or Br; and

each R is selected independently from alkyl of 1–4 carbon atoms, cycloalkyl of 5–6 carbon atoms, benzyl, phenyl, tolyl, and chlorophenyl.

4,234,730
PROCESS OF PREPARING SELECTIVE MIXTURES OF PIPERAZINE AND ETHYLENEDIAMINE

Thomas T. McConnell, and Thomas H. Cour, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Sep. 24, 1979, Ser. No. 78,117
Int. Cl.[3] C07D 295/02
U.S. Cl. 544—358 3 Claims

1. In a process of preparing a mixture of piperazine and ethylenediamine by reacting monoethanolamine and ammonia in presence of hydrogen and a nickel-copper-chromium catalyst; the improvement which comprises adjusting the ratio of ethylenediamine to piperazine in said product mixture by varying the hydrogen feed rate such that by increasing said feed rate said ratio is decreased.

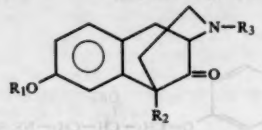
4,234,731
9-OXOBENZOMORPHAN PROCESS

Gerry Kavadias, St-Lambert, Canada, assignor to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 870,409, Jan. 18, 1979, Pat. No. 4,150,032.
This application Jan. 5, 1979, Ser. No. 1,131
Int. Cl.[3] C07D 221/26
U.S. Cl. 46—97 13 Claims

1. A process for preparing 2'-alkoxy-2,5-di-substituted-9-oxo-6,7-benzomorphan compounds of formula I

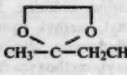
(I)



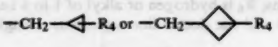
wherein

R_1 is lower alkyl of 1 to 4 carbon atoms inclusive or benzyl;

R_2 is lower alkyl of 1 to 4 carbon atoms inclusive, allyl, benzyl, or



R_3 is lower alkyl of 1 to 4 carbon atoms inclusive,

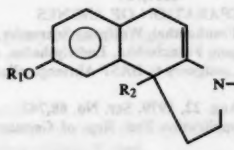


in which R_4 is hydrogen or methyl;

which comprises sequential steps of,

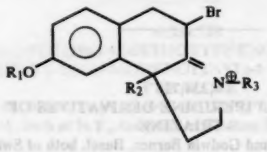
(a) brominating a dihydroben[e]indoline of formula II

(II)



in which R_1, R_2, and R_3 are as recited above wherein said bromination is carried out by combining a methylene chloride solution of the formula II compound and a solution of bromine in methylene chloride at a temperature in the range of −40° to −70° to produce a bromoenaminium bromide compound have formula III

(III)



in which R_1, R_2, and R_3 are as recited above;

(b) treating the formula III compound with a bicarbonate base selected from the group consisting of potassium bicarbonate, sodium bicarbonate, and ammonium bicarbonate for activated aluminum oxide to produce the 9-oxo-6,7-benzomorphan compound of formula I.

4,234,732

PHOTOINITIATORS

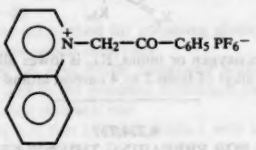
James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 949,642, Oct. 10, 1978, which is a division of Ser. No. 789,419, Apr. 21, 1977, Pat. No. 4,136,102, which is a division of Ser. No. 574,006, May 2, 1975, which is a continuation-in-part of Ser. No. 466,374, May 2, 1974, abandoned, Ser. No. 466,375, May 2, 1974, abandoned, and Ser. No. 466,378, May 2, 1974, abandoned. This application Dec. 17, 1979, Ser. No. 103,914

Int. Cl.³ C07D *215/14*

U.S. Cl. 546—174 1 Claim

1. The compound



4,234,733

PROCESS FOR PRODUCING ALIPHATIC CARBOXYLIC ACIDS AND ALIPHATIC CARBOXYLIC ACID ESTERS OF PHENOLS

Tomiya Isshiki, Tokyo; Yasuhiko Kijima, and Yuh Miyauchi, both of Matsudo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 24, 1978, Ser. No. 954,171

Claims priority, application Japan, Oct. 28, 1977, 52/129438

Int. Cl.³ C07C *51/09, 51/12, 27/00*; C07D *215/32*

U.S. Cl. 546—174 4 Claims

1. A process for producing an aliphatic carboxylic acid and an aliphatic carboxylic acid ester of an aromatic hydroxy compound which comprises reacting

(A) an aromatic hydroxy compound selected from the group consisting of phenol, cresol, xylenol, trimethylphenol, tetramethylphenol, pentamethylphenol, ethylphenol, propylphenol, thymol, 2-methyl-5-isopropylphenol, butylphenol, amylphenol, octylphenol, methyldibutylphenol, diethylphenol, catechol, resorcinol, hydroquinone, dihydroxytoluene, hexylresorcinol, pyrogallol, phloroglucinol, chlorophenol, bromophenol, nitrophenol, nitrosophenol, aminophenol, N,N-dimethylaminophenol, N-methyl-N-acetyl-phenol, acetyloxyphenol, formylphenol, cyanophenol, phenolsulfonic acid, hydroxymethylphenol, naphthol, dihydroxynaphthalene, dihydronaphthol, tetrahydronaphthol, phenylphenol, hydroxyquinolin, anthrahydroquinone, methylanthrahydroquinone, ethylanthrahydroquinone, amylanthrahydroquinone, and 1,2-dihydroxyanthraquinone,

(b) (1) an aliphatic carboxylic acid ester formed between an aliphatic carboxylic acid having 1 to 5 carbon atoms and an alcohol having 1 to 4 carbon atoms and selected from the group consisting of methyl formate, propyl formate, methyl acetate, ethyl acetate, butyl acetate, methyl propionate, ethyl propionate, methyl butyrate, propyl butyrate, methyl valerate, dimethyl oxalate, diethyl oxalate, and dimethyl succinate or (2) an aliphatic ether of 2 to 8 carbon atoms selected from the group consisting of dimethyl ether, diethyl ether, methyl ethyl ether, dipropyl ether, and dibutyl ether, and

(C) carbon monoxide at a temperature of from 50°–300° C. and a reaction pressure of 0–1000 kg./cm² G in the presence of a catalyst composed of at least one metal of Group VIII of the periodic table and a promotor composed of at least one iodine-containing substance selected from the group consisting of iodine and iodine compounds and separating and recoving the thus produced aliphatic carboxylic acid from the reaction mixture.

4,234,734

2,2,6,6-TETRAMETHYLPIPERIDINE DERIVATIVES

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

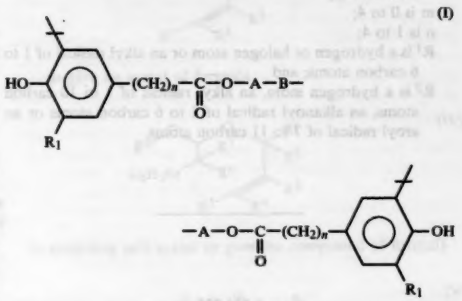
Filed Jul. 16, 1979, Ser. No. 57,628

Claims priority, application Switzerland, Jul. 21, 1978, 7904/78

Int. Cl.³ C07D *401/10, 401/06*

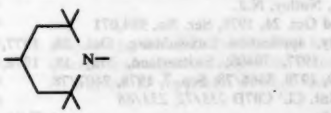
U.S. Cl. 546—188 4 Claims

1. A 2,2,6,6-tetramethylpiperidine of the formula I

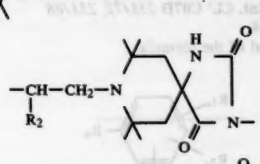


(I)

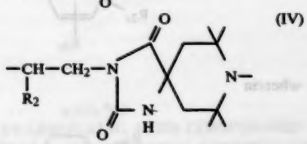
in which A is a radical of the formula II, III or IV, and in formula II B is bonded to the N atom,



(II),



(III),



(IV)

B is C_2–C_{12} alkylene, C_4–C_{10} alkenylene, C_6 alkynylene, xylylene or bitolylene, R_1 is H or C_1–C_{12}alkyl, R_2 is hydrogen, methyl, ethyl, phenyl or phenoxymethyl and n is 0, 1 or 2.

4. A compound according to claim 1, specifically 1,4-bis-{2,2,6,6-tetramethyl-4-[3-(3,5-di-tert.-butyl-4-hydroxyphenyl)-propionyloxy]-piperidin-1-yl}-but-2-ene.

4,234,735

GUANIDINO IMIDAZOLES AND THIAZOLES

Derrick F. Jones, Wilmington, Del., and Tobias O. Yellin, Wallingford, Pa., assignors to Imperial Chemical Industries Limited, London, England and ICI Americas Inc., Wilmington, Del.

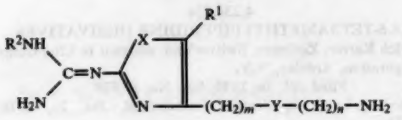
Continuation of Ser. No. 897,910, Apr. 19, 1978, Pat. No. 4,165,377. This application Aug. 13, 1979, Ser. No. 65,801

Claims priority, application United Kingdom, Apr. 20, 1977, 16389/77

Int. Cl.[3] **C07D** *277/38, 233/88;* **A61K** *31/425, 31/415*

U.S. Cl. 548—198 **10 Claims**

1. A guanidine compound of the following formula (III):



III

wherein

X is sulphur or NH;

Y is a direct bond, a methylene radical or a cis- or trans-vinylene radical;

m is 0 to 4;

n is 1 to 4;

R^1 is a hydrogen or halogen atom or an alkyl radical of 1 to 6 carbon atoms; and

R^2 is a hydrogen atom, an alkyl radical of 1 to 10 carbon atoms, an alkanoyl radical of 1 to 6 carbon atoms or an aroyl radical of 7 to 11 carbon atoms.

4,234,736

ANTIANDROGENIC AND SCHISTOSOMICIDAL IMIDAZOLIDINE DERIVATIVES

Karl Bernauer, Oberwil; Helmut Link, Basel, and Harro Stohler, Binningen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

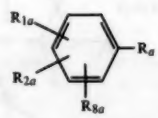
Filed Oct. 24, 1978, Ser. No. 954,071

Claims priority, application Luxembourg, Oct. 28, 1977, 78407; Oct. 28, 1977, 78408; Switzerland, May 19, 1978, 5465/78; May 19, 1978, 5466/78; Sep. 7, 1978, 9407/78

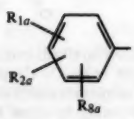
Int. Cl.[3] **C07D** *233/72, 233/88*

U.S. Cl. 548—314 **1 Claim**

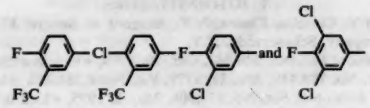
1. A compound of the formula



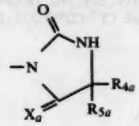
wherein



is selected from the group consisting of



and R_a is



wherein X_a is oxygen or imino, R_{4a} is lower alkyl and R_{5a} is hydrogen or alkyl of from 2 to 4 carbon atoms.

4,234,737

PROCESS FOR PREPARING THIENYLGLYOXYLIC ACIDS AND AMIDES

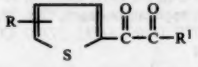
James M. Photis, Ridgefield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 25, 1979, Ser. No. 42,487

Int. Cl.[3] **C07D** *333/24;* **A61K** *31/38*

U.S. Cl. 549—70 **9 Claims**

1. A process for preparing thienylglyoxyl compounds represented by the structure



wherein R represents hydrogen, a halogen, an alkyl group having from 1 to about 8 carbon atoms, a cycloalkyl group having from 1 to about 8 carbon atoms or any combination thereof, and wherein R^1 represents NH_2 or OH which comprises reacting a thiophene carboxylic acid chloride with aqueous sodium cyanide in an inert, water-immiscible solvent in the presence of a phase transfer catalyst to form a thiophene carboxylic acid cyanide and reacting said thiophene acid cyanide with a strong mineral acid at a temperature and for a time sufficient to form said compound.

4,234,738

HYDROXY TERMINATED POLYBUTADIENE BASED POLYURETHANE BOUND PROPELLANT GRAINS

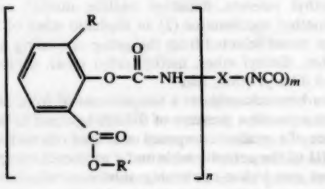
William H. Graham, and Inella G. Shepard, both of Huntsville, Ala., assignors to Thiokol Corporation, Newtown, Pa.

Division of Ser. No. 836,925, Sep. 26, 1977, Pat. No. 4,165,421, which is a division of Ser. No. 741,591, Nov. 15, 1976, Pat. No. 4,098,626. This application Nov. 17, 1978, Ser. No. 961,590

Int. Cl.[2] **C07C** *125/04;* **C08G** *18/32*

U.S. Cl. 560—32 **12 Claims**

1. A compound of the formula:



wherein X is an n+m valent organic radical; R is hydrogen or lower alkyl of from 1 to about 10 carbon atoms; R' is lower alkyl of from 1 to about 10 carbon atoms; a carbocyclic aryl of from 6 to about 10 carbon atoms; n is on the average at least 1; m is 0 or 1; and m+n must be at least 2.

4,234,739

METHOD FOR PREPARING GLYOXYLIC ACIDS AND DERIVATIVES THEREOF

James M. Photis, Ridgefield, Conn.; Fred S. Eiseman, Basking Ridge, and Sidney M. Gister, Highland Park, both of N.J., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 5, 1978, Ser. No. 966,673

Int. Cl.³ C07C *69/66, 59/153*

U.S. Cl. 560—51 **16 Claims**

1. An improved method for preparing glyoxylic acids and their derivatives which comprises:

(a) reacting an acyl nitrile compound with concentrated sulfuric acid in the presence of halogen anion to form a first reaction product; and

(b) reacting said first reaction product with a compound of the general formula

R OH

wherein R is hydrogen, a straight or branched-chain hydrocarbon or aralalkyl, provided, however, that ROH is not a tertiary alcohol, to form the acid, amide or ester.

4,234,740

PROCESS FOR PREPARING DIESTERS OF DICARBOXYLIC ACIDS

Sumio Umemura; Kanenobu Matsui; Yoshinari Ikeda; Katsuro Masunaga, and Takumi Kadota, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Nov. 28, 1978, Ser. No. 964,363

Claims priority, application Japan, Dec. 9, 1977, 52-147201

Int. Cl.³ C07C *67/38*

U.S. Cl. 560—81 **16 Claims**

1. A process for preparing a diester of a dicarboxylic acid having two more carbon atoms than the unsaturated hydrocarbon used as the starting material, which consists essentially of reacting in the liquid phase an unsaturated hydrocarbon, carbon monoxide and an alcohol in the presence of a platinum group metal; a compound selected from the group consisting of nitric acid, a nitrogen oxide, and an ester of nitrous acid used in an amount of from 0.0001 to 10 moles per liter of the reaction medium; and a halogen compound selected from the group consisting of (i) a halide of hydrogen, a platinum group metal, an alkali metal, an alkaline earth metal, cobalt, zinc, copper, iron, chromium, antimony, tin and manganese, and (ii) ammonium chloride, said halogen compound being used in an amount such that the ratio of the halogen atoms to the platinum group metal atoms is not more than 1.

4,234,741

PROCESS FOR THE PREPARATION OF γ, δ-UNSATURATED ESTERS AND ACIDS

Martin Petrzilka, Puplinge, Switzerland, assignor to Firmenich, S.A., Geneva, Switzerland

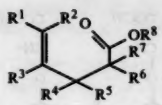
Filed Aug. 16, 1979, Ser. No. 67,025

Claims priority, application Switzerland, Aug. 30, 1978, 9136/78

Int. Cl.³ C07C *51/00, 163/00*

U.S. Cl. 560—211 **10 Claims**

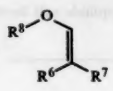
1. A process for the preparation of a compound of formula



(I)

wherein symbols R^1 to R^7 are identical or different and each represents a hydrogen atom or an alkyl radical and R^8 is an alkyl radical, which comprises the following subsequent steps:

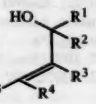
a. reacting an alkyl-vinyl ether of formula



(II)

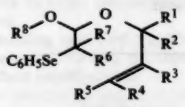
with a benzene-selenenyl halide,

b. adding to the thus obtained reaction mixture an allylic alcohol of formula



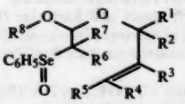
(III)

to give an acetal of formula



(IV)

c. oxidizing said acetal to give the compound of formula



(V)

and,

d. subjecting oxide (V) thus obtained to an intra-molecular thermal rearrangement to give the desired ester of formula (I) wherein R^8 represents an alkyl radical.

4,234,742

BIS-(ARYLOXYCARBOXYLIC ACID) COMPOUNDS

Jean C. Cognacq, Maule, and Jean Lacrampe, Courbevoie, both of France, assignors to Hexachimie, France

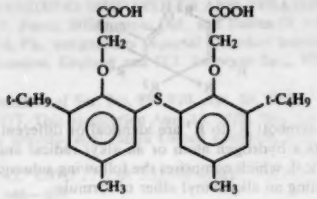
Filed Jun. 5, 1979, Ser. No. 45,665

Claims priority, application France, Jun. 14, 1978, 78 17814

Int. Cl.³ C07C *149/40*; A61K *31/185*

U.S. Cl. 562—426 **2 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof.

4,234,743

ISOMERIC DIAMINOBENZOPHENONEDICARBOXYLIC ACIDS AND METHOD FOR PREPARING SAME

Johann G. Schulz, Pittsburgh; Anatoli Onopchenko, Monroeville, and Edward T. Sabourin, Allison Park, all of Pa., assignors to GR & DC, Pittsburgh, Pa.

Filed May 17, 1979, Ser. No. 39,868

Int. Cl.³ C07C *101/68*

U.S. Cl. 562—457 **3 Claims**

1. A novel isomeric mixture containing 3,3'-diamino-4,4'-benzophenonedicarboxylic acid, 4,4'-diamino-3,3'-benzophenonedicarboxylic acid and 3,4'-diamono-3',4-benzophenonedicarboxylic acid.

4,234,744

PROCESS FOR THE PRODUCTION OF AMINOACID HYDROCHLORIDES/OR DIAMINOACID DIHYDROCHLORIDES

Franz Effenberger, Stuttgart, and Karlheinz Drauz, Heilbronn, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

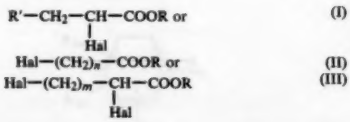
Filed Dec. 17, 1979, Ser. No. 104,064

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1978, 2854627

Int. Cl.³ C07C *99/00*

U.S. Cl. 562—562 **14 Claims**

1. A process for the production of an aminoacid hydrochlorides or a diaminoacide dihydrochlorides comprising reacting an ester of a halocarboxylic acid having the formula:



(I)

(II)

(III)

in which Hal is chlorine or bromine, R is methyl or ethyl, R' is hydrogen or an alkyl group with 1 to 6 carbon atoms, n is one or a whole number between 3 and 5 inclusive and m is a whole number between 2 and 4 inclusive, in an aprotic solvent at a temperature between 80° and 120° C. with an alkali metal cyanate of the formula MeOCN in which Me is lithium, sodium or potassium, and methanol or ethanol and subsequently saponifying the alkoxycarbonylaminocarboxylic acid ester or bis-(alkoxycarbonylamino)-carboxylic acid ester with a mixture of equal parts of concentrated hydrochloric acid, 100 weight percent formic acid and water at reflux temperature.

4,234,745

POLYOLS DERIVED FROM 4,4,4-TRICHLORO-1,2-EPOXYBUTANE AND/OR EPIHALOHYDRIN FOR USE IN THE PRODUCTION OF HEAT SEALABLE FOAMS

Barry A. Phillips, Slovan; Keith G. Spitler, Bethel Park, both of Pa., and Richard E. Keegan, New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1979, Ser. No. 8,147

Int. Cl.³ C07C *43/11*

U.S. Cl. 568—614 **8 Claims**

1. A polyol having a molecular weight of 2,000 to 8,000, comprising the adduct obtained by sequentially reacting:

(a) a polyhydroxyl initiator, with a functionality of 2 to 5 and a weight average molecular weight as determined by gel permeation chromatography of from 62 to 200; with

(b) 10 to 90%, by weight, based on the total oxide present in (b)+(c)+(d), a first alkylene oxide; and subsequently reacting the product with

(c) 10 to 80%, by weight, based on the total oxide present in (b)+(c)+(d), 4,4,4-trichloro-1,2-epoxybutane and/or epihalohydrin; and subsequently reacting the product with

(d) 10 to 60%, by weight, based on the total oxide present in (b)+(c)+(d), a second alkylene oxide, which may be the same or different than the first alkylene oxide of step (b).

4,234,746

METALLO-SUBSTITUTED NAPHTHALENE

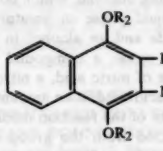
Henry Rapoport, Berkeley, and Clinton D. Snyder, Monte Sereno, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 815,771, Jul. 14, 1977, Pat. No. 4,159,993, which is a division of Ser. No. 565,473, Apr. 7, 1975, Pat. No. 4,089,873, which is a continuation-in-part of Ser. No. 540,450, Jan. 13, 1975, abandoned. This application Mar. 8, 1979, Ser. No. 18,578

Int. Cl.³ C07C *43/192*

U.S. Cl. 568—633 **3 Claims**

1. Compounds of the formula



wherein R is lower alkyl and R_1 and R_2 are lower alkyl, or aralkyl of 7 to about 12 carbon atoms, and M is MgBr.

4,234,747

PROCESS FOR THE MANUFACTURE OF BUTENEDIOL

Christopher J. McIndoe, Redcar, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 20, 1979, Ser. No. 59,329

Claims priority, application United Kingdom, Aug. 2, 1978, 32013/78

Int. Cl.³ C07C *31/20*

U.S. Cl. 568—857 **10 Claims**

1. A process for the manufacture of 2-butene-1, 4-diol which comprises reacting butadiene with water and oxygen in the presence of an iron catalyst.

4,234,748
PROCESS FOR THE HYDRATION OF OLEFINS EMPLOYING SLURRIED CATALYST

Orville D. Frampton, Wyoming, and William R. Birchall, Cincinnati, both of Ohio, assignors to National Distillers and Chemical Corp., New York, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,891
Int. Cl.³ C07C 29/04
U.S. Cl. 568—901 34 Claims

1. A process for the liquid phase hydration of olefin to the corresponding alkanol in an olefin hydration reactor which comprises hydrating olefin at elevated temperature and superatmospheric pressure in an aqueous reaction medium containing a catalytically effective amount of at least one substantially water-insoluble olefin hydration catalyst in the form of solid particles substantially uniformly distributed throughout the entire reaction medium to provide an aqueous reaction medium containing alkanol, unreacted olefin and suspended catalyst, continuously or intermittently withdrawing a portion of the reaction medium through an expansion valve to simultaneously flash off alkanol and unreacted olefin and cool the residual aqueous catalyst suspension, and cooling the flash-off vapors to condense the alkanol as dilute aqueous alkanol.

18. A process for the liquid phase hydration of olefin to the corresponding alkanol in an olefin hydration reactor which comprises hydrating olefin at elevated temperature and superatmospheric pressure in an aqueous reaction medium containing a catalytically effective amount of at least one substantially water-insoluble olefin hydration catalyst in the form of solid particles substantially uniformly distributed throughout the entire reaction medium to provide an aqueous reaction medium containing alkanol, unreacted olefin and suspended catalyst, continuously or intermittently withdrawing alkanol-containing vapor above the reaction medium through an expansion valve and passing the expanded, cooled vapor through a low pressure water absorber to absorb the alkanol and provide dilute aqueous alkanol.

4,234,749
CATALYTIC OXIDATION/DECARBONYLATION OF POLYNUCLEAR AROMATIC COMPOUNDS

Francis P. Daly, Lawrenceville, N.J., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Feb. 1, 1979, Ser. No. 8,305
Int. Cl.³ C07C 46/00, 4/26
U.S. Cl. 585—319 29 Claims

1. A process of producing benzene from anthracene comprising:

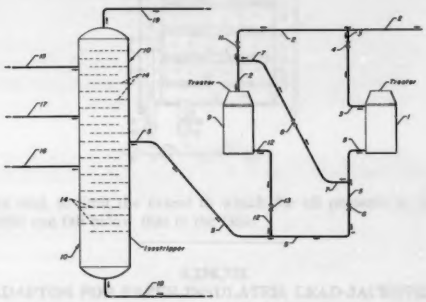
(a) oxidizing the anthracene to anthraquinone by reacting the anthracene with a molecular oxygen-containing gas in the presence of a catalyst selected from the group consisting of ceric ammonium nitrate, ceric nitrate, ceric ammonium sulfate, ceric sulfate, ceric perchlorate or other compounds of Ce^{+4}, and in the presence of a promoter, the reaction being carried out at a temperature of from about 65° to about 205° C. in an essentially water-free environment;

(b) thermally cracking the anthraquinone obtained in (a) at a temperature of from about 425° to about 760° C., and in an inert atmosphere to form benzene.

4,234,750
HF ALKYLATION PROCESS

Michael Z. Mikulicz, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 27, 1979, Ser. No. 69,683
Int. Cl.³ C07C 2/18, 2/60
U.S. Cl. 585—332 12 Claims



1. In a process for the acid-catalyzed alkylation of an isoparaffin with an olefin alkylating agent wherein the hydrocarbon phase of the alkylation reaction mixture comprising alkylate, unreacted isoparaffin and at least trace amounts of acid, and field paraffins comprising isoparaffins, n-paraffins and olefins, are introduced into a common fractionation column wherein said alkylate, n-paraffins and isoparaffins are separated at conditions conducive to olefin polymerization, the improvement which comprises:

(a) initially treating said field paraffins in contact with a siliceous material effecting the separation of said olefins from said field paraffins; and,

(b) thereafter introducing said field paraffins into said common fractionation column together with said hydrocarbon phase of said alkylation reaction mixture.

4,234,751
SELECTIVE CRACKING OF PHENYLALKANES

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 27, 1979, Ser. No. 61,222
Int. Cl.³ C07C 4/06
U.S. Cl. 585—486 14 Claims

1. A process for selective cracking of the 2-phenylalkane isomer contained in mixtures comprising said 2-phenylalkane isomer with other positional isomers of said phenylalkane; said process comprising contacting said isomeric mixture with a crystalline zeolite catalyst having a constraint index of about 1 to 12 and a silica to alumina ratio of at least about 12, said contacting being at a temperature of between about 150° C. and about 550° C. and at a pressure of between about 10^4 N/m^2 and about 10^6 N/m^2.

4,234,752
DEHYDRATION OF ALCOHOLS

Yulin Wu, and Stanley J. Marwil, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 28, 1979, Ser. No. 79,744
Int. Cl.³ C07C 1/27
U.S. Cl. 585—640 6 Claims

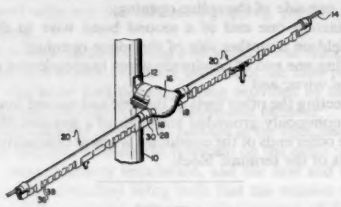
1. A process for the conversion of an alcohol to an olefin which comprises subjecting said alcohol under dehydration reaction conditions of temperature and pressure to the presence of gamma-alumina in the presence of an inert carrier gas.

4,234,753

ELECTRICAL INSULATOR AND CONDUCTOR COVER

Melvin E. Clutter, Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed May 18, 1979, Ser. No. 40,129
Int. Cl.[3] H01B *17/58*
U.S. Cl. 174—5 R 5 Claims



1. An electrical conductor cover comprising:

an elongated, open-ended member formed of resilient, electrically insulative material,

said member being configured to present an upper tubular, conductor-receiving section, and a pair of elongated, depending, side-by-side, laterally spaced closure legs extending from the tubular section,

said legs normally biased together in abutting contact with each other to present a central line of juncture therebetween, when the cover is in use with a conductor received within said tubular section, for substantially completely surrounding the conductor, said legs being selectively separable for permitting positioning of a conductor within the tubular section,

each of said legs being configured to present a series of inwardly extending, upright, elongated ribs for cooperatively maintaining said conductor in spaced relationship to the outermost margin of the legs remote from the tubular section, in the event that the cover, when in use, is subjected to an impact normally tending to spread said legs and thus expose said conductor, the innermost surfaces presented by the series of ribs on each leg being disposed such that an upright imaginary plane between said legs and coincident with said line of juncture passes uninterruptedly along the length of said cover between the separate series of ribs.

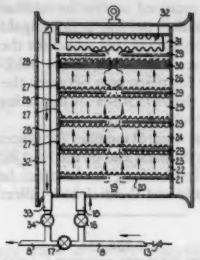
4,234,754

OIL-FILLED ELECTRIC CABLE INSTALLATIONS COMPRISING PRESSURIZING OIL TANKS

Derek R. Edwards, Windsor, and Cyril H. Gosling, Beckenham, both of England, assignors to BICC Limited, London, England

Filed Feb. 23, 1979, Ser. No. 14,727
Claims priority, application United Kingdom, Feb. 28, 1978, 7964/78
Int. Cl.[3] H01B *9/06*
U.S. Cl. 174—14 R 4 Claims

1. An oil-filled electric cable installation comprising (i) at least one cable comprising at least one metallic conductor, insulation surrounding the conductor, an enclosing fluid-tight sheath and at least one oil duct extending from end to end of the cable inside the sheath, the cable comprising a plurality of sections defined by stop-joints (ii) oil tanks for maintaining the cable sections filled with oil under pressure and (iii) oil ducts connecting said oil tanks to the stop-joints wherein: at least one said oil duct comprises two passages in parallel; the first passage provides a percolating filter through which oil normally flows when passing from the cable to the tank; and the second passage contains a one-way valve permitting flow of oil from



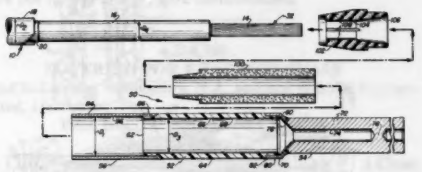
the tank to limit the extent to which the oil pressure in the cable can fall below that in the tank.

4,234,755

ADAPTOR FOR PAPER-INSULATED, LEAD-JACKETED ELECTRICAL CABLES

Craig W. Simons, Hackettstown, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,401
Int. Cl.[3] H02G *15/23, 1/14*
U.S. Cl. 174—19 18 Claims



1. An adaptor capable of placement at the terminus of a high voltage electrical cable having diametral dimensions falling within a given range of sizes, the cable being of the oil-filled type including a conductor, a paper insulator and a lead jacket, each having a terminal end adjacent the cable terminus, to seal the terminus and enable installation, in the field, of an electrical connector of the type employing a premolded elastomeric component part for use in an electrical power distribution system, the premolded elastomeric component part having an internal surface, said adaptor comprising:

a sleeve portion of insulating material extending axially between a first end and a second end, the sleeve portion having an axially extending outer surface complementary to the internal surface of the permolded elastomeric component part and an axially extending opening with an inside diameter larger than the diameter of the insulator of the cable of largest diameter in said given range of sizes, said insulating material being essentially impervious to water and to the oil in the cable;

a conductor-sealing portion integral with the first end of the sleeve portion and sealing the opening in the sleeve portion adjacent the first end thereof, the conductor-sealing portion having an axially extending, electrically conductive sheath including an internal passage communicating with the opening in the sleeve portion and corresponding in diameter to the diameter of the conductor of the cable, the internal passage having a closed end remote from the first end of the sleeve;

a jacket-sealing portion integral with the second end of the sleeve portion, the jacket-sealing portion including an axially extending tubular-walled portion capable of being juxtaposed with the lead jacket to seal the juncture between the lead jacket and the adaptor, the tubular-walled

portion having an internal diameter greater than the external diameter of the lead jacket of the cable of largest diameter in said given range of sizes such that the lead jacket will be received within the tubular-walled portion, said tubular-walled portion being capable of permanent deformation toward the lead jacket for the formation of an oil and water seal therewith, in the field;

a dielectric filler for placement between the insulator of the cable and the sleeve portion of insulating material to fill any void therebetween; and

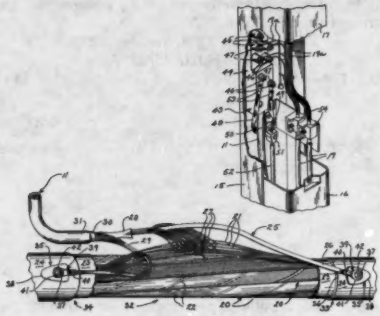
an electrical stress control member for placement in juxtaposition with the terminal end of the lead jacket for controlling electrical stress along the interface between the insulator of the cable and the dielectric filler.

4,234,756

PRETERMINATED BLOCK SYSTEM AND METHOD OF INSTALLING SAME

Michael J. Jackula, and Hans J. Ziegler, both of Milwaukee, Wis., assignors to Reliable Electric Company, Franklin Park, Ill.

Filed Mar. 29, 1979, Ser. No. 25,009
Int. Cl.³ H02G 9/02
U.S. Cl. 174—38 **20 Claims**



1. A preterminated block system, comprising:

a distribution cable which includes distribution wires circumferentially surrounded by a cable shield, said distribution cable having a splice opening along a portion of its length to define separate sections of cable shield;

terminal means including a grounded terminal and conductive terminals for providing service connections to the distribution cable;

a first bond conductor connected between one section of cable shield and the grounded terminal of said terminal means;

a second bond conductor connected between the other section of cable shield and the grounded terminal of said terminal means; and

conductor wires bonded at their lower ends to preselected distribution wires and connected at their upper ends to the conductive terminals of said terminal means.

11. An article of manufacturing, comprising:

a terminal block which includes ground terminals and a plurality of conductive terminals; and

a cable stub connected to said terminal block which includes:

(a) a first bond conductor connected at one end to a ground terminal of said terminal block;

(b) a second bond conductor connected at one end to another ground terminal of said terminal block; and

(c) conductor wires connected at their upper ends to the conductive terminals of said terminal block.

15. A method of installing a preterminated block system which includes a distribution cable having distribution wires circumferentially surrounded by a metallic cable shield and a cable jacket circumferentially surrounding the cable shield, comprising the steps of:

forming a splice opening in the distribution cable to expose the distribution wires by removing a portion of the cable jacket and shield at a predetermined interval along the length of the distribution cable;

terminating one end of a first bond wire to the cable shield on one side of the splice opening;

terminating one end of a second bond wire to the cable shield on the other side of the splice opening;

bonding one end of conductor wires to preselected distribution wires; and

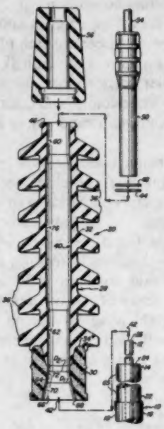
connecting the other ends of the first and second bond wires to commonly grounded terminals of a terminal block and the other ends of the conductor wires to conductive terminals of the terminal block.

4,234,757

ELECTRICAL CABLE ACCESSORIES CONFIGURED FOR LUBRICATED INSTALLATION

Craig W. Simons, Hackettstown, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed May 31, 1978, Ser. No. 911,158
Int. Cl.³ H02G 15/064
U.S. Cl. 174—73 R **18 Claims**



1. In a cable accessory to be installed at the terminus of an electrically shielded cable by using a lubricant to ease the installation, the cable having an outside diameter falling within a predetermined range between a smallest diameter and a largest diameter, the cable including a conductor, insulation surrounding the conductor, and a conductive shield surrounding the insulation, the cable having a portion of the shield removed to expose the insulation thereof beyond a terminal region of the shield, and having a portion of the insulation removed to expose the conductor beyond a terminal region of the insulation, the terminal region of the exposed insulation being positioned between a terminal region of the exposed conductor and the terminal region of the exposed shield:

a sleeve-like member of essentially solid elastomeric material having an open end through which the terminus of the cable is to be passed and an axially-extending opening for receiving the cable terminus, the opening including a resiliently dilatable insulation-gripping portion for firmly gripping the insulation and an inlet passage extending between the insulation-gripping portion and the open end of the sleeve-like member;

the inlet passage being flared radially outwardly in the direction from the insulation-gripping portion toward the open end such that the inside diameter of the inlet passage at the

open end is substantially larger than the largest diameter of said predetermined range, the inlet passage including a first axially-extending portion tapering downwardly from a maximum diameter at the open end to a first prescribed diameter spaced axially from the open end, and a second axially-extending portion tapering downwardly from the first prescribed diameter to a second prescribed diameter located adjacent the insulation-gripping portion of the opening;

the sleeve-like member having a substantial wall thickness at the second axially-extending portion of the inlet passage, the substantial wall thickness being provided by the solid elastomeric structure of the sleeve-like member;

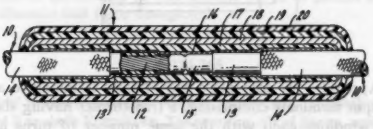
the inside diameter of the inlet passage at the open end being large enough to permit the lubricant on the cable to enter the opening during installation, and the first and second prescribed diameters being such that the relative dimensions of the second axially-extending portion of the inlet passage and a cable having an outside diameter within said predetermined range, together with the substantial wall thickness provided by the solid elastomeric structure of the sleeve-like member at the second axially-extending portion, will assure that the surrounding conductive shield of the cable will be gripped firmly at a location along the second axially-extending portion of the inlet passage, the first prescribed diameter being spaced axially from the second prescribed diameter so as to enable the terminal region of the shield to be located axially anywhere therein between, the second axially-extending portion being adapted, by virtue of said relative dimensions and said substantial wall thickness, to grip radially the terminal region of the shield so as to substantially reduce any voids between the inlet passage and the terminal region of the shield while compensating for a variation in the axial location of the terminal region of the shield relative to the terminal region of the insulation and the terminal region of the conductor.

4,234,758

CABLE SPLICE

Raymond L. Guzy, Morton Grove, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 3, 1978, Ser. No. 957,383
Int. Cl.³ H02G *15/08*
U.S. Cl. 174—84 R **7 Claims**



1. A cable splice comprising a metallic sleeve member extending over conductor end portions and frictionally engaging the conductor end portions;

a layer of adhesive covering said sleeve member and extending over the exposed cable insulation;

an insulation layer of uncured thermosetting elastomeric polymer tape surrounding the layer of adhesive in a helical wrap;

an overlapped layer of fabric surrounding said insulation layer;

a helically-wrapped layer of heat-shrinkable polymeric material tape surrounding said layer of fabric, and

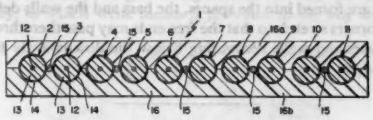
a sleeve of heat shrinkable polymeric material surrounding the layer of heat shrinkable polymeric material tape.

4,234,759

MINIATURE COAXIAL CABLE ASSEMBLY

Norman R. Harlow, Central Valley, N.Y., assignor to Carlisle Corporation, Buchanan, N.Y.

Filed Apr. 11, 1979, Ser. No. 29,119
Int. Cl.³ H01B *7/08*
U.S. Cl. 174—104 **9 Claims**



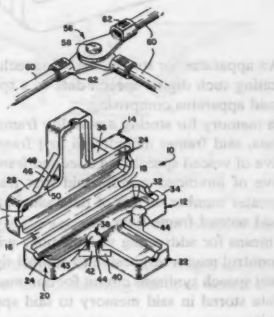
1. A flat coaxial cable assembly comprising: a plurality of parallel and spaced coaxial cables, each said cable comprising a center conductor individually surrounded by a dielectric covering which, in turn, is surrounded by an individual conductive shield in contact with the dielectric covering around its periphery; a plurality of drain wires disposed between alternate adjacent pairs of said cables and parallel thereto, each said wire being in conductive contact with the exterior surfaces of the shields of the pair of cables adjacent thereto, whereby said drain wires are omitted between every other pair of adjacent cables leaving a space therebetween; and a sheath of insulating material encasing said cables and said drain wires, insulating material of said sheath extending from one surface of said assembly to the other surface thereof intermediate pairs of cables not having a drain wire therebetween.

4,234,760

COVERING FOR T-TAP TERMINALS

Gustaf R. Lawson, Willingboro, N.J., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 18, 1978, Ser. No. 970,508
Int. Cl.³ H02G *15/113*
U.S. Cl. 174—138 F **1 Claim**



1. A covering for T-tap terminals or the like, comprising:

a. first and second T-shaped halves molded from resilient insulative material and each half being of generally the same structural form with the T-shape being provided by a short section perpendicularly joining a long section intermediate its end, further, each half having a cavity with openings thereto at the ends of the long section, and at the free end of the short section;

b. a hinge attached to both halves with the cavities facing each other; and

c. locking means, located in each of the exterior corners formed by and at the junction of the short and long section, for locking the two halves together, said locking means including posts on one half and bars on the other half, said posts having a downwardly facing shoulder

located below a free end and on an outwardly facing side of the post, said free end cylindrical at least adjacent the downwardly facing shoulder, said bars being spaced from and extending diagonally across the corners with the space therebetween being less than the diameter of the cylindrical portion of the free end of the posts so that as the two halves are brought together and the free ends of the posts are forced into the spaces, the bars and the walls defining the corners stretch so that the free ends may pass therethrough, said bars and walls recovering below the downwardly facing shoulders.

4,234,761

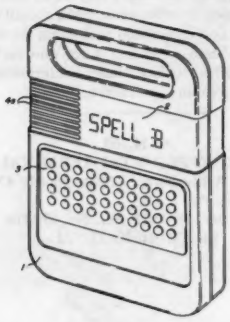
METHOD OF COMMUNICATING DIGITAL SPEECH DATA AND A MEMORY FOR STORING SUCH DATA

Richard H. Wiggins, Jr., Dallas, and George L. Brantingham, Lubbock, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 901,392, Apr. 28, 1978. This application Jun. 19, 1978, Ser. No. 916,989

Int. Cl.[2] G11C *13/00*; G10L *1/08*

U.S. Cl. 179—1 SM **8 Claims**



1. An apparatus for storing digital speech data and for communicating such digital speech data to a speech synthesis circuit, said apparatus comprising:

(a) a memory for storing a plurality frames of digital speech data, said frames including a first frame type representative of voiced speech and a second frame type representative of unvoiced speech, said first frame type having a greater number of bits of data associated therewith than said second frame type;

(b) means for addressing said memory with an address; and

(c) control means responsive to control signals generated by said speech synthesis circuit for communicating the digital data stored in said memory to said speech synthesis circuit.

4,234,762

RING TRIP DETECTOR CIRCUIT

Barry S. Bosik, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

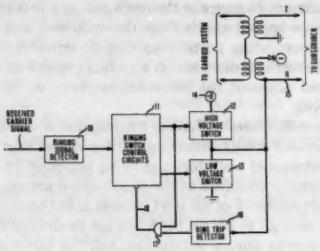
Filed Dec. 29, 1978, Ser. No. 974,387

Int. Cl.[3] H04M *3/04*

U.S. Cl. 179—18 HB **6 Claims**

1. A ring trip detection circuit for subscriber loop carrier systems wherein the ringing signal source provides one half-cycle of the ringing signal which is of a substantially higher voltage than the other half-cycle, said detection circuit characterized by

a voltage detector for detecting an off-hook condition in a telephone subscriber station set, and



means for enabling said voltage detector only during said half-cycle having said substantially higher voltage.

4,234,763

FEEDING BRIDGE WITH D.C.-COMPENSATION FOR BOTH DIRECTIONS OF THE FEED CURRENT

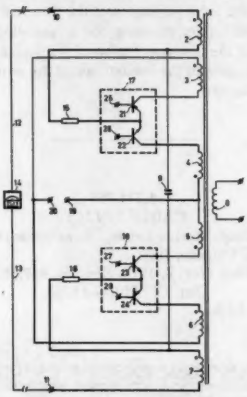
Eise C. Dijkmans; Barend Ijff, both of Eindhoven, and Antonius H. J. Reuvekamp, Blantyre, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 9, 1979, Ser. No. 55,844

Claims priority, application Netherlands, Jul. 19, 1978, 7807706

Int. Cl.[3] H04M *19/08*

U.S. Cl. 179—77 **9 Claims**



5. Apparatus for coupling a pair of input terminals to a pair of output terminals comprising, a transformer having six primary windings each with the same number of turns and a second winding coupled to the output terminals, a capacitor, first and second complementary transistor circuits each having a pair of control terminals, first and second impedance elements, means serially connecting a first primary winding, the capacitor and a sixth primary winding of the transformer across the input terminals with the first and sixth windings polarized in the same sense, first and second supply terminals for connection to a source of voltage, means serially connecting a third primary winding of the transformer, a first part of the first transistor circuit, the first impedance element and said first primary winding of the transformer between said first supply terminal and a first one of said input terminals and with said first and third windings polarized in the opposite sense, means serially connecting a fourth primary winding, a first part of the second transistor circuit, the second impedance element

and said sixth primary winding between said first supply terminal and a second one of said input terminals and with said fourth and sixth windings polarized in the opposite sense, means serially connecting a second primary winding of the transformer, a second part of the first transistor circuit, said first impedance element and the first primary winding between the second supply terminal and the first input terminal, means serially connecting a fifth primary winding of the transformer, a second part of the second transistor circuit, the second impedance element and the sixth primary winding between the second supply terminal and the second input terminal, and means for applying control signals to the control terminals of said first and second transistor circuits to control the operation thereof so as to reverse the direction of current flowing from said supply terminals to said input terminals.

4,234,764

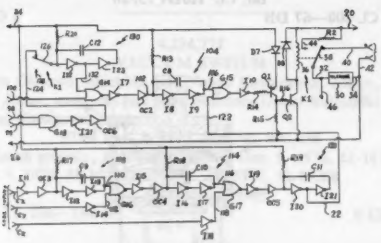
LONG DISTANCE TELEPHONE CALL SECURITY SYSTEM

Ronald Beebe, 1159 Locke Ave., Simi Valley, Calif. 93065

Filed Jan. 22, 1979, Ser. No. 5,674

Int. Cl.³ H04M *1/66, 1/36*

U.S. Cl. 179—90 D **20 Claims**



1. A security system for a telephone instrument normally connected to a central office and operable by actuation of certain of a plurality of digits, and wherein a long distance call must be initiated by the initial actuation of at least one predetermined digit from said plurality of digits on the instrument, which comprises:

first means responsive to the initial actuation of said predetermined digit for disconnecting said telephone instrument from said central office for a first-time period; and

second means responsive during said first time period to the actuation of at least one additional digit predetermined from said plurality of digits for reconnecting said telephone instrument to said central office to permit a long distance call to be completed.

4,234,765

KEY TELEPHONE SYSTEM

Kouichi Sekiguchi, Asaka; Hikaru Takematsu, Higashikurume, and Kazutada Katsukura, Tokorozawa, all of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Tokyo, Japan

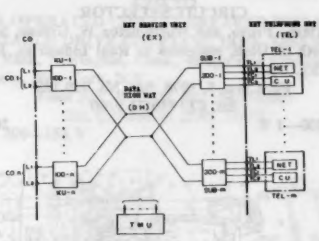
Filed Jun. 21, 1978, Ser. No. 917,578

Claims priority, application Japan, Jun. 25, 1977, 52-74928; Jun. 25, 1977, 52-74929; Jun. 25, 1977, 52-74930; Jun. 25, 1977, 52-74931; Jun. 25, 1977, 52-74932

Int. Cl.³ H04Q *5/18*

U.S. Cl. 179—99 M **10 Claims**

1. A key telephone system, in which a key service unit comprises a spatially divided temporary storage means for temporarily storing CO line seizure information under control of time slots designated in correspondence to a plurality of CO lines, closing means for forming a DC closed loop in respect of a seized one of the CO lines by an output from the storage means, a plurality of circulating memories provided in correspondence to a plurality of key telephone sets, and first pulse generating means for generating a clock pulse train, in which second pulse generating means is provided in each of the plurality of key telephone sets for deriving output pulses synchronized with pulses of the clock pulse train from the first pulse generating means, control information sending means provided in each of the plurality of key telephone sets for producing control information for the CO line selection by the output from the second pulse generating means and a CO line selecting key, in which write means is provided in the key service



unit for receiving and detecting the control information to write the control information in a selected one of the circulating memories at an address designated by the result of the detection; and in which the output from the circulating memory is applied to the temporary storage means, thereby to seize that one of the plurality of CO lines designated by the actuation of the CO line selecting key in each of the key telephone sets.

4,234,766

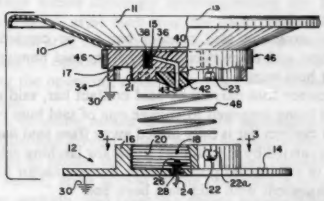
SPEAKER ASSEMBLY

Gibson C. Cacho, 4006 Dorsey Rd.-Lot C, Charleston, S.C. 29405

Filed Feb. 5, 1979, Ser. No. 9,643

Int. Cl.³ H04R *9/02, 9/06;* G10K *13/00*

U.S. Cl. 179—115.5 R **5 Claims**



1. A two piece speaker assembly, the improvement comprising:

a cone means including a flexible, lightweight diaphragm;

a base with means interconnecting the cone means with the base;

said cone means including a carrier having a pair of annular recesses extending in opposite directions and including a first recess providing a receptacle to receive a speaker coil;

a second annular recess including a fastening means;

said base including a cavity;

connecting means positioned adjacent said cavity on said base for cooperative engagement with the fastening means of the cone for securely and removably interconnecting the cone unit with the base;

said carrier of the cone unit including a circular magnet attached thereto and providing a magnetic field;

a coil carrier with means extending into the first annular cutout and having means for mounting said speaker coil thereto;

said diaphragm having means attached to the coil carrier and

providing movable means for reciprocating movement in response to movement of the coil carrier;

electrical means for providing an electrical impulse to the speaker coil and moving the coil in said magnetic field to move the attached diaphragm and produce an audible sound.

4,234,767

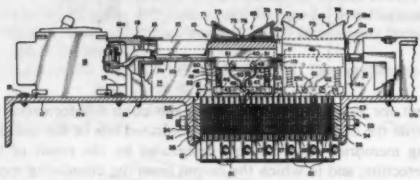
CIRCUIT SELECTOR

Ariel R. Davis, Provo, and Worthington W. Greene, Salt Lake City, both of Utah, assignors to Rual Industries, Inc., Salt Lake City, Utah

Filed Sep. 5, 1978, Ser. No. 939,125

Int. Cl.³ H01H *9/00*

U.S. Cl. 200—1 R **26 Claims**



1. A circuit selector comprising

a support frame;

a plurality of spaced apart buss bars carried by said support frame;

means for connecting each of said buss bars to a source of power;

an electrically conductive guide rail carried by the support frame;

means for electrically connecting said guide rail to stage lights or the like to be operated;

a slider member including a hanger slidable on said guide rail;

a contact bar;

means mounting said contact bar to be carried by said hanger and to be biased away from said hanger towards said buss bars;

a contactor foot carried by said contact bar, said contactor foot being arranged to engage one of said buss bars when said contact bar is fully biased away from said hanger; and

means carried by the support frame for latching said contact bar in a retracted position with the contractor foot out of engagement with said buss bars; and

an electrically conductive flexible shunt cable interconnecting the contact bar and the hanger, whereby an electrical circuit is completed through the contactor foot, the contact bar, the shunt cable and hanger to the guide rail.

4,234,768

SELECTIVE FIRE PERFORATING GUN SWITCH

Gene T. Boop, Ft. Worth, Tex., assignor to Sie, Inc., Ft. Worth, Tex.

Continuation-in-part of Ser. No. 745,686, Nov. 29, 1976, Pat. No. 4,100,978, which is a division of Ser. No. 535,355, Dec. 23, 1974, Pat. No. 4,007,796. This application Apr. 24, 1978, Ser. No. 899,705

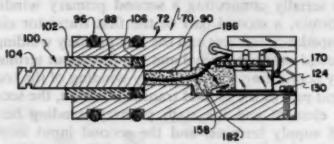
Int. Cl.³ H01H *9/00, 15/00*

U.S. Cl. 200—52 R **19 Claims**

1. A switch comprising:

a plurality of contacts, means mounting the contacts for relative movement, and a member effecting relative movement of the contacts upon application of an impact force thereto; and

means for applying a contact moving impact force to the member including a receptacle having therein a body of flowable material spaced from the member and means for generating an unconfined stream of material from the



receptacle and for directing the same against the member including means for applying pressure to the material.

4,234,769

ELECTRICAL SWITCH HAVING A FLOATING BRIDGE MEMBER

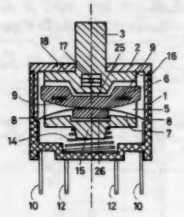
Gert M. Brandt, Bronshoj, and Soren R. Hansen, Ballerup, both of Denmark, assignors to Aktieselskabet MEC Mekanisk Elektrisk Compagni af 1975, Ballerup, Denmark

Filed Feb. 12, 1979, Ser. No. 11,699

Claims priority, application Denmark, Feb. 22, 1978, 785/78

Int. Cl.³ H01H *13/26*

U.S. Cl. 200—67 DB **1 Claim**



1. An electrical switch including a housing and a button, which button, by means of a manual depression in a single direction, is movable relative to the housing between two positions and during this movement causes a snap spring inserted in the button to slip from a first extreme position to a second one, characterized in

that said snap spring (**7**) is set up to a bow between two bearings or seats (**8**) provided in opposite walls of the housing,

that a central part of said snap spring is placed in a bridge member (**6**) carrying resilient contact fingers (**9**), and

that said bridge member (**6**) is arranged with a two-sided clearance (**25,26**) in a recess provided in the button (**3**).

4,234,770

SECTIONALIZED PORCELAIN INSULATOR HAVING REMOVABLE CIRCUIT BREAKER

Kosuke Higuchi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Tanagawa, Japan

Filed Jun. 12, 1978, Ser. No. 914,774

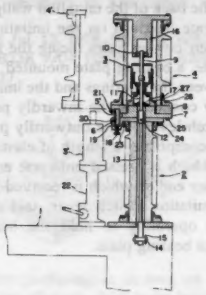
Claims priority, application Japan, Jun. 21, 1977, 52-72803

Int. Cl.³ H01H *9/08;* B65D *6/00;* H01B *17/04;* H01H *33/66*

U.S. Cl. 200—144 B **2 Claims**

1. In a porcelain insulator type circuit breaker including a lower porcelain tube secured to a supporting frame, an upper porcelain tube mounted on said lower porcelain tube in axial alignment therewith, and an interrupting unit provided in said upper porcelain tube, the improvement which comprises means for interconnecting said upper porcelain tube and said lower porcelain tube in a manner permitting rotation of said upper porcelain tube relative to said lower porcelain tube to displace said upper porcelain tube from axial alignment with said lower porcelain tube, said means comprising a jack bolt

for upwardly forcing said upper porcelain tube from said lower porcelain tube and a hinge for interconnecting said upper and lower porcelain tubes so that said jacked-up upper porcelain



tube can be rotated about said hinge so as to permit removal of said interrupting unit from the lower end of the rotated upper tube.

4,234,771

VACUUM SWITCH

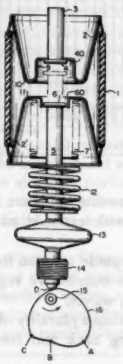
Mikio Ohkawa, Machida, and Nobuo Kawashima, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Dec. 5, 1977, Ser. No. 857,458

Claims priority, application Japan, Dec. 9, 1976, 51-147164; Dec. 9, 1976, 51-164123[U]; Feb. 14, 1977, 52-14208

Int. Cl.[2] H01H *33/66*

U.S. Cl. 200—144 B **6 Claims**



1. In a vacuum switch comprising a vacuum vessel having an insulating cylinder and end plates which are air-tightly sealed to both ends of said insulating cylinder, relatively movable first and second contacts, and a bellows attached to one of said end plates, the improvement which comprises a first metal plate having a first annular edge portion and a relatively long first cylindrical reentrant portion extending from the inner end of said first edge portion in parallel with said insulating cylinder, a second metal plate having a second annular edge portion opposed to said first edge portion and a second cylindrical reentrant portion extending from the inner end of said second edge portion in parallel with said insulating cylinder, said second reentrant portion being coaxial with said first reentrant portion, said first and second edge portions being disposed in parallel with a predetermined spacing therebetween, and means for separating said contacts such that said contacts are firstly separated in said first reentrant portion of said first metal plate at the time of current interruption and that one of said contacts is then moved into the second cylindrical reentrant portion of said second metal plate for increasing the insulating distance after the current interruption.

4,234,772

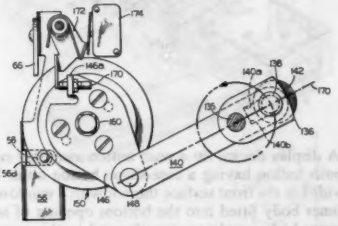
MOTOR OPERATED CIRCUIT BREAKER INCLUDING A VARIABLE DRIVE COUPLING LINK ASSEMBLY

Eric H. Rask, Newington, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jun. 25, 1979, Ser. No. 51,587

Int. Cl.[3] H01H *3/30, 73/12*

U.S. Cl. 200—153 V **7 Claims**



1. In a circuit breaker equipped with a motor operator mechanism functioning to reciprocate a circuit breaker operating member from a home position through a first stroke in one direction and then through a second stroke in the opposite direction back to the home position, the motor operator mechanism including a unidirectionally rotating output shaft to which is affixed a first crank arm, and a second crank arm drivingly coupled with the operator member, a variable drive coupling assembly comprising, in combination:

A. linkage means drivingly interconnecting the first and second crank arms such that, for each revolution of the first crank arm, the second crank arm is propelled through successive, oppositely directed throws effective in motivating the operating member through its first and second strokes;

B. drive coupling means operative to establish a constant first effective driving length in said linkage means which is utilized to propel the operating member through its second stroke, upon arrival of the operating member at its home position, said coupling means automatically effectuating a lost motion connection between the first and second crank arms, said lost motion connection providing a coasting zone through which the first crank arm may revolve without disturbing the home position of the operator member;

C. cam means operative at the conclusion of said coasting zone to establish a second effective driving length in said linkage means, the differential between said first and second effective driving lengths defining the limits of said lost motion connection, said second effective driving length being utilized to propel the operating member into its first stroke, said cam means acting on said drive coupling means to progressively change the effective driving length in said linkage means such that said first effective driving length therein is re-established by the conclusion of the first stroke of the operator member, thereby equalizing the lengths of the first and second strokes thereof; and

D. switch means acting in response to the arrival of the operator member at its home position to deactivate the motor operator mechanism.

4,234,773

DISPLAY DEVICE FOR A PUSH BUTTON ASSEMBLY

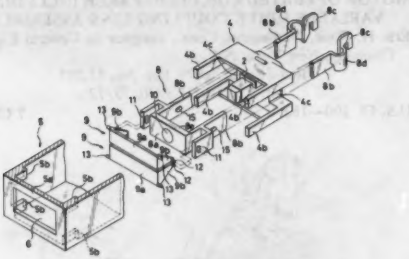
Kiyotaka Nakatani, and Kunikazu Konno, both of Isezaki, Japan, assignors to Hosiden Electronics Co., Ltd., Japan

Filed May 3, 1979, Ser. No. 35,566

Claims priority, application Japan, May 15, 1978, 53-65399[U]; Aug. 3, 1978, 53-107087[U]

Int. Cl.³ H01H *9/00, 9/16*

U.S. Cl. 200—308 9 Claims



1. A display device for a push button assembly comprising:

a push button having a case-shape button outer body provided in the front surface thereof with a window, a button inner body fitted into the bottom opening of said button outer body, guide grooves formed in the opposite inner lateral sides of said button outer body, and side grooves formed in both lateral sides of said button inner body;

a display plate housed in said push button with the display surface thereof faced to said window;

a support inserted into said push button with a pair of parallel leg members of said support slideably inserted into said side grooves of said button inner body, the end portions of said leg members which are extended to the outside of said push button, being securely fixed to the frame of said push button assembly; and

at least one shutter rotatably connected to the portions of the support which are inserted into said push button, and adapted to be rotated with the pivoted ends of said shutter guided by said guide grooves, between a first position wherein said display surface is screened from said window and a second position wherein said display surface is exposed to said window, responsively to the axial relative movement of said push button with said support.

4,234,774

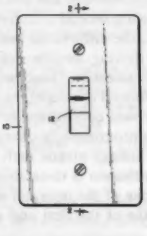
IMITATION WALL SWITCH

James B. Paparella, Andover, Mass., assignor to American Publishing Corporation, Watertown, Mass.

Filed Mar. 19, 1979, Ser. No. 22,214

Int. Cl.² H01H *3/20*

U.S. Cl. 200—330 6 Claims



1. An imitation wall switch of large size for use in conjunction with a conventional wall switch of the kind wherein there is a wall plate through which projects one end of a toggle lever, comprising an imitation wall plate containing a centrally-located opening, an imitation switch lever, means mounting the imitation switch lever in the opening with one end projecting from the face of the imitation wallplate and the other end projecting from the back of the imitation wallplate, said means comprising accurate bearings on the imitation switch lever, arranged with their convex sides facing the inner side of the imitation wallplate, a bearing plate mounted on the imitation switch lever between the bearings and the imitation wallplate, a means operably connecting the inwardly projecting end of the imitation switch lever to the outwardly projecting end of the toggle lever, comprising a length of elasticly flexible tubing, one end of which is pressed onto one end of the toggle lever, and the other end of which is received in an opening in the end of the imitation switch lever, said elasticly flexible length of tubing operating to hold the bearings rockably pressed against the bearing plate.

4,234,775

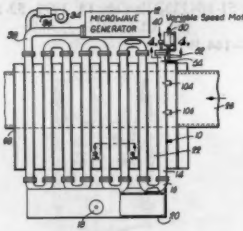
MICROWAVE DRYING FOR CONTINUOUSLY MOVING WEBS

Larry B. Wolfberg, and John Harper, both of Wichita, Kans., assignors to Technical Developments, Inc., Wichita, Kans.

Filed Aug. 17, 1978, Ser. No. 934,417

Int. Cl.³ H05B *6/78*

U.S. Cl. 219—10.55 A 12 Claims



1. A drier for removing moisture associated with a web advancing along a predetermined path of travel, said drier including:

an elongated wave guide adapted for conduction of electrical energy in the microwave region characterized by a series of standing waves,

said wave guide having a plurality of serially interconnected sections extending back and forth across said path of travel,

each of said sections having means permitting the passage of the moving web through the wave guide transversely of said sections;

a source of said electrical energy coupled with the wave guide for producing said standing waves;

a tuning device coupled with said wave guide and adapted for selective adjustment to tune the wave guide and the particular web associated therewith to the frequency of said source of electrical energy; and

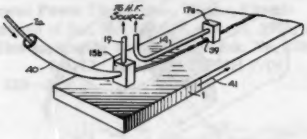
continuously moving means separate from said device and associated with said wave guide for continuously disrupting said standing waves at a selectively adjustable rate and causing the peaks thereof to oscillate along the various sections, thereby avoiding stationary alignment of the wave peaks in one section with those in another section to the end that the drying effects of the microwave energy are dispersed throughout the width of the web.

4,234,776

METHOD OF PRODUCING AREAS OF ALLOY METAL ON A METAL PART USING ELECTRIC CURRENTS

Wallace C. Rudd, New Canaan, and Humfrey N. Udall, Darien, both of Conn., assignors to Thermatool Corp., Stamford, Conn.

Filed Jul. 12, 1978, Ser. No. 923,778
Int. Cl.[3] B23K 9/04; H05B 6/00; B23K 11/00
U.S. Cl. 219—76.17 27 Claims



1. A method for producing in an area on the surface of a metal part, a volume of metal which is the fusion product of the metal of said part and an alloying material which forms an alloy with, and has a composition different from, the metal of said part, said fusion product having a composition different from that of the metal of said part and said volume of metal being structurally continuous, said method comprising:

heating the metal in said area of said surface to at least its melting temperature without heating adjacent metal to its melting temperature thereby to provide a pool of molten metal of said part extending inwardly from said surface and to be mixed with said alloying material, said heating being performed by causing an electric current having a frequency of at least 3000 Hz to flow in said area while causing a current of the same frequency to flow in a conductor overlying said area but which, at any instant, flows oppositely to the direction of the current flow in said area, said conductor being spaced from said area by a distance not greater than three times the width of said conductor, said current being caused to flow in said area by contacting said part with contacts respectively contacting the surface of the metal part at opposite ends of said area and connected to a source of said current, at least one of said contacts being connected to said source in series with said conductor;

depositing said alloying material on said area before, during or after heating of the metal of said area and heating said alloying material unit at least a portion thereof melts and the alloying material mixes with the molten metal of said part and the metal of said area is structurally continuous; and

cooling the metal of said area to form a volume of metal in said area at the surface of said metal part which extends inwardly from said surface, which comprises an alloy of the metal of said part and of said alloying material formed in situ and which is structurally continuous.

4,234,777

PROGRAMMED WELDING MACHINE WITH WELD HEAD SPEED OVERRIDE

Fredrick J. Balfanz, Waukesha, Wis., assignor to C-R-O, Inc., Menomonee Falls, Wis.

Continuation-in-part of Ser. No. 24,696, Mar. 28, 1979. This application Aug. 15, 1979, Ser. No. 65,175
Int. Cl.[3] B23K 9/12
U.S. Cl. 219—125.1 7 Claims

1. In a welding machine for joining a plurality of pairs of metal pieces along substantially identical weld grooves disposed between said pieces:

(a) a frame,

(b) a plurality of carriages, each being mounted to said frame for movement relative to a respective first axis,

(c) a rotator suspended beneath each said carriage and with said rotator being rotatable about a C axis disposed generally perpendicularly to said pieces,

(d) a weld head suspended beneath each said carriage for forming a weld in one of said grooves,

(e) a sensor suspended beneath each said carriage for following the contour of the respective groove in advance of the respective weld head,

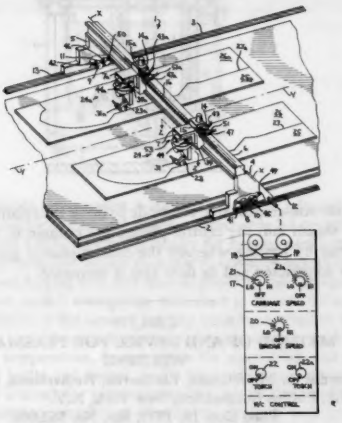
(f) each said weld head and sensor being rotatable with a respective rotator with respect to a said C axis,

(g) first and second motive means:

(1) to selectively drive each said carriage along its respective first axis, and

(2) to rotate each said rotator about its respective C axis,

(h) each said first and second motive means being actuatable



in response to a programmable input control unit to cause each said sensor and weld head to traverse a programmed path at a given speed, and with said path generally corresponding to that of the respective groove,

(i) program override means connected to each said rotator and responsive to a deviation in the respective groove perpendicular to the respective programmed path and sensed by the respective sensor to cause said rotator and its weld head to move from the programmed path to a corrected path which is in correspondence with the actual path formed by the respective groove,

(j) and second override means connected to the program override means of each said rotator for selectively changing the speed of movement of the respective weld head in a direction parallel to the respective groove.

4,234,778

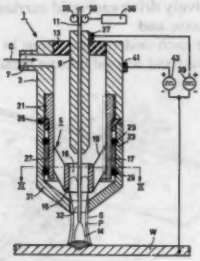
METHOD OF AND WELDING TORCH FOR ARC WELDING

Gerardus A. M. Willems, and Gerrit W. Tichelaar, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1978, Ser. No. 896,235
Claims priority, application Netherlands, Apr. 26, 1977, 7704527
Int. Cl.[3] B23K 9/16
U.S. Cl. 219—121 P 1 Claim

1. A method of plasma-MIG welding, which comprises providing a single nozzle non-consumable electrode having a central orifice and a surrounding annular opening; flowing a thermally ionizable gas stream from a common gas source through said single nozzle non-consumable electrode toward a workpiece, said single nozzle splitting said gas stream into a central gas column surrounded by a parallelly flowing annular gas sheath, said annular gas sheath and said central gas column having the same composition as they flow past the outlet of said single nozzle; feeding a consumable electrode through said central gas column toward the workpiece; first establishing a MIG-arc between said consumable electrode and said work-

piece; then spontaneously establishing a plasma arc by means of said MIG-arc between said single nozzle non-consumable electrode and said workpiece to ionize said central gas column and sustain a plasma flow enveloping said MIG-arc, the surrounding annular gas sheath remaining non-ionized and relatively colder than the resulting central plasma gas column; and constricting the annular gas sheath downstream of the single



nozzle non-consumable electrode to drive the relatively colder gas sheath into the central plasma gas column to expand the former by heating whereby the central plasma gas column is also constricted and its flow rate is increased.

4,234,779

METHOD OF AND DEVICE FOR PLASMA-MIG WELDING

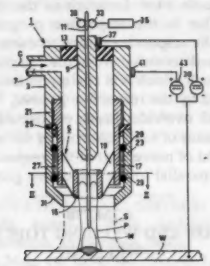
Gerardus A. M. Willems, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,008

Claims priority, application Netherlands, Jan. 31, 1977, 7700971

Int. Cl.³ B23K *9/00*

U.S. Cl. 219—121 P **4 Claims**



1. A method of plasma-MIG welding, which comprises providing a single nozzle non-consumable electrode having a central aperture and a surrounding annular aperture; flowing a thermally ionizable gas stream from a common gas source through said single nozzle non-consumable electrode toward a workpiece, said single nozzle splitting said gas stream into a central gas column surrounded by a parallelly flowing annular gas sheath, said annular gas sheath and said central gas column having the same composition as they flow past the outlet of said single nozzle; feeding a consumable electrode through said central gas column toward the workpiece; first establishing a MIG-arc between said consumable electrode and said workpiece; and then spontaneously establishing a plasma arc by means of said MIG-arc between said single nozzle non-consumable electrode and said workpiece to ionize said central gas column and sustain a plasma flow enveloping said MIG-arc, the surrounding annular gas sheath remaining non-ionized.

4,234,780

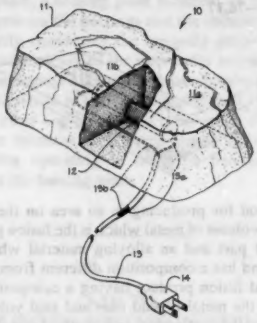
RESTING PLACE FOR REPTILES IN CAPTIVITY

Gregory M. McCarthy, 180 Mayfield Ave., Mountain View, Calif. 94043

Filed May 12, 1978, Ser. No. 905,220

Int. Cl.³ A01K *61/00*; H05B *1/00*

U.S. Cl. 219—200 **1 Claim**



1. A reptile rest or pad comprising a simulated natural rock formed with uneven surface portions on its sides and top, said top surface forming a resting place for reptiles, said rock being formed as a cast body of conrete, electric heating means embedded within said rock for warming same to attract an elongate reptile to lie upon said top surface, said rock having an exposed, uneven, abrasive, peripheral side wall surface, said periphery having a length serving to permit a reptile to extend substantially around same as said reptile rubs against said side wall surface to aid in shedding its skin.

4,234,781

METHOD AND ARRANGEMENT FOR HEAT-WELDING TOGETHER TWO TUBULAR ELEMENTS

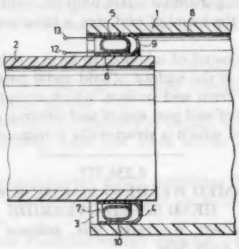
Birger Flink, Porsvägen 4 B, S-752 46 Upsala, Sweden

Filed Nov. 22, 1978, Ser. No. 962,877

Claims priority, application Sweden, Dec. 19, 1977, 7714441

Int. Cl.³ H05B *3/06*; F16L *47/02*

U.S. Cl. 219—243 **2 Claims**



1. A system of joining together by heat-welding two tubular elements of thermoplastic material and of mutually different diameters, subsequent to inserting one end of one said element into one end of the other to leave an annular gap therebetween, said system comprising:

(a) a ring-shaped welding sleeve which is located in said gap and which is made of a meltable thermoplastic material,

(b) a recoverably deformed pressure-generating ring-shaped body made of a heat-recoverable plastic material inserted within the welding sleeve,

(c) heat-generating means arranged to cooperate with said ring-shaped body in a manner such as to heat the same and

to bring the welding sleeve and said mutually opposing wall surfaces to a fusible state.

4,234,782

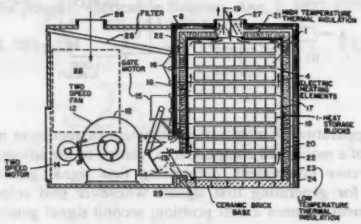
SPACE HEATING USING OFF-PEAK ELECTRIC HEAT STORAGE

Miklos F. Barabas; William B. Cooke; R. H. Stephen Hardy, and Arun Verma, all of Regina, Canada, assignors to Saskatchewan Power Corporation, Regina, Canada

Continuation of Ser. No. 567,104, Apr. 11, 1975, abandoned. This application Jan. 19, 1978, Ser. No. 870,711

Int. Cl.[3] H05B *1/02*; F24H *7/04*

U.S. Cl. 219—365 11 Claims



1. An electrical heating unit comprising:

a mass of solid heat storage material for storing heat generated electrically during off-peak electrical power periods;

means associated with the mass of solid heat storage material for electrically generating heat for storage in the heat storage material;

a casing having an outer jacket and an inner jacket with an air space therebetween, the heat storage material being enclosed in the inner jacket;

means associated with the solid mass of heat storage material for withdrawing heat stored in the mass of solid heat storage material, said heat withdrawing means including an air inlet passage communicating with the air space between the inner and outer jackets and with the interior of the inner jacket; and an air outlet passage communicating with the space between said inner and outer jackets with the interior of said inner jacket;

a two-speed fan disposed to draw air into said air inlet passage;

an air flow control gate in one of said air passages, the air flow control gate being movable to select the path of air flowing from said inlet air passage to said outlet air passage, control means for moving said gate to selectively direct the air driven by the fan in one of three manners including (1) only through the air space between the two jackets, (2) only through the interior of the inner jacket thereby causing the air to pick up heat directly from the mass of solid heat storage material and (3) in two parts with one part being directed through the air space between the two jackets the other part being directed through the interior of the inner jacket, the two air parts being subsequently blended together in said air outlet passage for delivery to a space to be heated; and

means for controlling operation of the fan between its two speeds, said fan control means being responsive to the position of said air flow control gate and operating said fan on the lower of its two speeds when the air flow control gate is set to allow air flow only through the air space between the jackets and operating the fan on the higher of its two speeds when the air flow control gate is set to allow air flow other than only through the air space between the jackets.

4,234,783

ELECTRIC RICE COOKERS

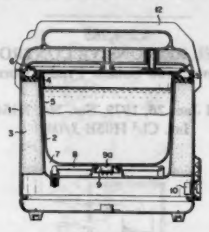
Terutaka Aoshima, Toyohashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 11, 1979, Ser. No. 47,240

Claims priority, application Japan, Jun. 16, 1978, 53-73656; Jun. 16, 1978, 53-73657

Int. Cl.[3] F27D *11/02*

U.S. Cl. 219—441 5 Claims



1. An electric rice cooker comprising a kettle adapted to contain a quantity of rice and water, a removable lid covering the top of said kettle, an electric heater for heating said kettle, a temperature sensitive switch disposed to sense temperature of said kettle and having first and second contacts, said temperature sensitive switch energizing said electric heater through said first contact at the time of starting cooking operation, but transferring to said second contact in response to a cooking completion temperature, frame means for supporting and enclosing said kettle and heater, and a timer energized through said second contact for reenergizing said heater for a definite interval a predetermined time after energization of said timer.

4,234,784

COOKING APPLIANCE CONTROLS

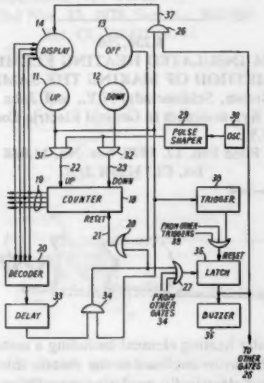
Anthony C. Totterdell, London, England, assignor to Thorn Domestic Appliances (Electrical) Limited, London, England

Filed Jan. 2, 1979, Ser. No. 184

Claims priority, application United Kingdom, Jan. 17, 1978, 1849/78

Int. Cl.[3] H05B *1/02*; G08C *9/00*

U.S. Cl. 219—506 9 Claims



1. A cooking appliance having controls comprising an array of touch pads and a display device for displaying a preset temperature value, the touch pads including at least one pad for changing the preset and displayed temperature value for a cooking facility of the appliance, control means responsive to touching of the touch pads to store a signal representing the

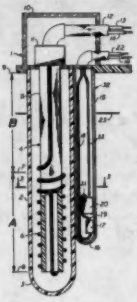
preset temperature value for the facility, and means responsive to the stored signal to control the supply of power to the cooking facility, wherein the control means are arranged to initiate a predetermined delay whenever the preset temperature value reaches at least one of the maximum and minimum presettable values and at the end of the delay to effect at least one of the operations of terminating the supply of power to the facility and providing a warning signal, if a touched pad is still signalling that it is touched at the end of the delay.

4,234,785

LIQUID LEVEL RESPONSIVE CONTROL DEVICE

Fredrick L. Lefebvre, 700 Solano Prado, Coral Gables, Fla. 33156

Filed Jan. 26, 1979, Ser. No. 7,154
Int. Cl.³ H05B *3/06*
U.S. Cl. 219—523 **7 Claims**



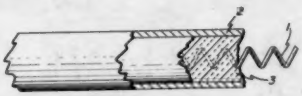
1. Liquid level responsive control means for use in connection with the heating of liquid in tanks, comprising a control unit, main power supply connections therefore, a source of radiant energy to be immersed in the liquid being heated and connected to said unit to be energized for radiation generation, sensing instrumentalities closely adjacent said source, said instrumentalities including a recycling switch connected to said unit, said switch being operable to terminate operation of the said source, when the switch is subjected to direct radiation from the source aforesaid when the liquid reaches a predetermined lower level.

4,234,786

MAGNESIA INSULATED HEATING ELEMENTS AND METHOD OF MAKING THE SAME

Marcus P. Borom, Schenectady, N.Y., and John Schultz, Jr., Louisville, Ky., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,068
Int. Cl.³ H05B *3/50*
U.S. Cl. 219—544 **4 Claims**



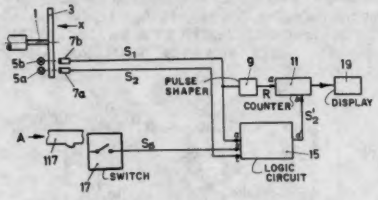
1. In a tubular heating element including a metal sheath and a coaxial coil resistor enclosed in the sheath, the combination of a compacted electrically insulating mass filling the space in the sheath between the resistor and the sheath and comprising fused magnesia and from about 0.1% to about 10% of a glass of softening temperature below about 700° C. having resistivity greater than about 10^7 ohm-cm at 600° C. and being thermodynamically stable in oxygen partial pressure of 10^{-15} atmosphere at temperature in the range of 750° to 1100° C.

4,234,787

APPARATUS FOR MONITORING THE MOTION OF SHUTTLES IN LOOMS OR THE LIKE

Willi Hutter, Roggwil, and Kurt Huber, Arbon, both of Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Jul. 6, 1978, Ser. No. 922,574
Claims priority, application Austria, Jul. 15, 1977, 5133/77
Int. Cl.³ G06M *3/06*
U.S. Cl. 235—92 MP **10 Claims**



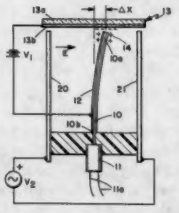
1. Apparatus for monitoring the extent of recurrent movements of a monitored component in relation to the advances of a reference component, comprising first signal generating means for generating first signals whenever said reference component assumes a first position; second signal generating means for generating second signals in response to identical incremental advances of said reference component; third signal generating means for generating a third signal whenever said monitored component assumes a predetermined position in its path of movement, and fourth signal generating means connected to said first, second and third signal generating means and operative for generating fourth signals each of which denotes the number of second signals generated by said second signal generating means during an interval which elapses between the generation of a first signal by said first signal generating means and the generation of the next-following third signal by said third signal generating means.

4,234,788

ELECTROSTATIC FIBER OPTIC SCANNING DEVICE

John P. Palmer, Pomona, and Scott M. Rose, Mountain View, both of Calif., assignors to General Dynamics Corporation, Pomona Division, Pomona, Calif.

Filed Apr. 6, 1979, Ser. No. 27,550
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **8 Claims**



1. A fiber optic scanning device with improved electrostatic positioning comprising:

an optical fiber of predetermined length having one unsupported end for scanning, and having another end rigidly supported in a cantilevered fashion;

electrically conductive means rigidly attached to said fiber and extending from said unsupported end to said supported end;

a transparent conductive plate lying in a plane perpendicular to the length of said fiber and spaced apart from said

unsupported end to form a capacitance C with said conductive means;

a voltage source V coupled between said transparent conductive plate and said electrically conductive means on said fiber to thereby produce an electrostatic charge Q on said conductive means near said movable end where Q=VC; and

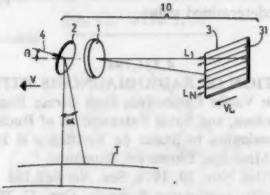
means for generating an electric field E transverse to the length of said fiber to position said movable end with a force F=QE.

4,234,789

OBSERVATION OPTICAL APPARATUS

Maurice Fournet, Meudon, France, assignor to Organisation Europeenne de Recherches Spatiales, Paris, France

Filed Jul. 24, 1978, Ser. No. 927,532
Claims priority, application Belgium, Aug. 2, 1977, 0179836
Int. Cl.³ H01J 3/14
U.S. Cl. 250—234 **3 Claims**



1. An optical observation system for a movable body in space, said system comprising: optical means having a narrow angular field for imaging a viewed scene onto the image plane thereof, said optical means having a plurality of spectral channels and having scanning means such that each image point in said plane is displaced across said image plane in a direction which makes an acute angle with respect to the direction of movement of said movable body;

planar sensor means located in said image plane for generating electric signals proportional to the irradiance, said sensor means comprising a plate with an array of photodetector elements arranged in a plurality of parallel detection lines, said detection lines extending in a direction which is parallel to the direction of said displacement of the image point in the image plane, n gratings insulated from one another and placed parallel to one another and to said plate, said gratings being coupled to successive groups of respective photodetector elements in each detection line, and said gratings being further connected to be fed with recurrent drive pulses for shifting the electric signal from each photodetector element to succeeding ones of them in each detection line at a rate equal to the rate of said displacement of the image point, with the drive pulses for each grating having a phase shift of 360°/n relative to the pulses for each of the other gratings;

a second plurality of photodetector elements aligned in a direction perpendicular to the direction lines with each photodetector element in said second plurality of photodetector elements being coupled to the end of a respective one of said detection lines, n second gratings insulated from one another and placed parallel to one another and to said plate, said second gratings being coupled to successive groups of respective photodetector elements in said second plurality of photodetector elements, said second gratings being further connected to be fed with recurrent drive pulses for shifting the electric signal from each of said second photodetector elements to succeeding ones of them, thereby to multiplex the detection signals from the output ends of said detection lines; and

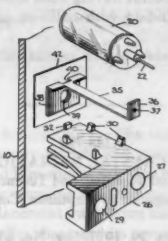
reading-out means coupled for sensing the electric signals developed at the output end of each of said detection lines.

4,234,790

PHOTODETECTOR HEAT STABILIZER

Charles F. deMey, II, West Redding, and Charles C. Helms, Trumbull, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 1, 1979, Ser. No. 8,373
Int. Cl.³ H01J 7/24
U.S. Cl. 250—238 **7 Claims**



1. A photodetector mounting structure for rapidly heating the photodetector to operating temperature comprising:

(a) a photodetector having a photocathode,

(b) a heat conductive casting,

(c) a block of insulating material on which said photodetector is mounted,

(d) a metallic strip positioned on said block of insulating material,

(e) said metallic strip having one end thereof coupled to said photocathode and the other end thereof coupled in heat conducting relationship with said casting, and

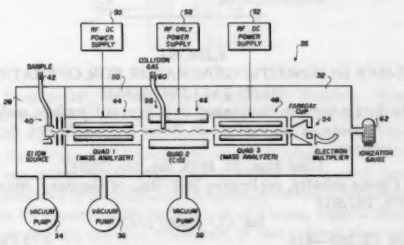
(f) electrical insulating means mounted between said casting and said metallic strip.

4,234,791

TANDEM QUADRUPOLE MASS SPECTROMETER FOR SELECTED ION FRAGMENTATION STUDIES AND LOW ENERGY COLLISION INDUCED DISSOCIATOR THEREFOR

Christie G. Enke; Richard A. Yost, both of East Lansing, Mich., and James D. Morrison, Mooroolbark, Australia, assignors to Research Corporation, New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,439
Int. Cl.² B01D 59/44
U.S. Cl. 250—281 **21 Claims**



1. A selected ion mass spectrometer for the analysis of unknown samples comprising:

a source capable of ionizing unknown sample molecules of widely varying molecular weights to produce molecular ions, fragment ions, and/or other ions derived from sample components;

first and second mass analyzers in tandem;

means for directing ionized unknown sample molecules,

fragments or otherwise derived ions of sample components from said source into said first mass analyzer;

means, interposed between said mass analyzers, for fragmenting and/or reacting, by collision-induced dissociation or reaction, ionized sample molecules, fragments or derivatives selected by said first mass analyzer, the fragmentation and/or reaction being accomplished within a focus device and being induced by unknown sample ions, fragments or components having axial kinetic energies of less than 1 keV colliding with collision gas atoms or molecules; and

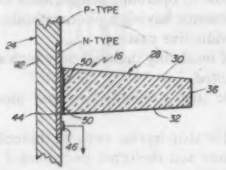
a detector responsive to the output of said second mass analyzer.

4,234,792

SCINTILLATOR CRYSTAL RADIATION DETECTOR

Donald F. DeCou, West Redding, and Terence Roach, Fairfield, both of Conn., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 29, 1977, Ser. No. 837,958
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—361 R **5 Claims**



1. An invisible radiation detector comprising a scintillator crystal of material capable of scintillating when subjected to a beam of invisible radiation, and a photodiode mounted on one end surface of said crystal, said crystal also having an opposed end surface, said one end surface of the crystal having means for enhancing the passage of light photons from the crystal to the photodiode, the remaining surfaces of the crystal being provided with means for enhancing the collection of light photons generated within the crystal, said crystal having one selected surface directed toward said radiation and an opposed surface, said selected and opposed surfaces having adjacent ends disposed adjacent said photodiode, and said selected and opposed surfaces being convergently inclined in a direction away from said photodiode.

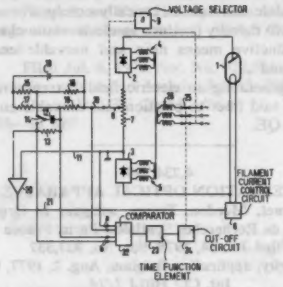
4,234,793

X-RAY DIAGNOSTIC GENERATOR FOR OPERATION WITH FALLING LOAD

Heribert Amtmann, Buckenhof, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 30, 1979, Ser. No. 25,617
Claims priority, application Fed. Rep. of Germany, May 24, 1978, 2822811
Int. Cl.[2] H05G *1/42*
U.S. Cl. 250—414 **2 Claims**

1. An x-ray diagnostic generator for operation with falling load with a control means for controlling x-ray tube output, and a function generator which, during an x-ray exposure, generates a rated value signal for the x-ray tube output according to a falling exponential function which effects the adjustment of the x-ray tube output via the control means, characterized by a cut-off element (24) actuatable for shutting off x-ray tube operation prior to expiration of the x-ray exposure time, and a comparator (22) for comparing the actual and the rated value of the x-ray tube output, and connected to the cut-off element (24) for actuating the same to switch off x-ray tube



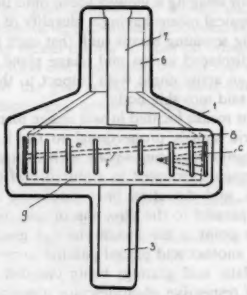
operation when the difference between actual and rated value exceeds a predetermined value.

4,234,794

INSTALLATION OF RADIODIAGNOSIS WITH SWEEP

Vasile Voinea; Vasile Catuneanu; Ioan Birzu; Eugen Teisanu; Maria I. Voinea, and Sorin Patrascu, all of Bucharest, all of Romania, assignors to Statia de Verificare si Intretinere a Aparaturii Medicale, Bucharest, Romania

Filed Nov. 20, 1978, Ser. No. 962,153
Claims priority, application Romania, Dec. 22, 1977, 92587
Int. Cl.[3] H05G *1/70*
U.S. Cl. 250—416 TV **7 Claims**



1. A radiodiagnosis-tomography apparatus comprising:

a radiodiagnosis tube including:

a sealed envelope having a cylindrical axially extending first portion, a cylindrical axially extending second portion, coaxial with said first portion and of a larger diameter than said first portion, and a third portion coaxial with said first and second portions and of a smaller diameter than said second portion,

a rotary anode in said second portion,

a rotatable body forming part of an electric motor in said third portion operatively connected to said anode for rotating same,

a cathode in said second portion extending axially from said first portion and juxtaposed with said anode and cooperating therewith to produce an outwardly directed X-ray beam sweeping around said second portion, and

an annular radio-opaque shield of a metal of high atomic weight and high melting point disposed in said second portion and surrounding said anode, said shield being formed with at least one opening and being provided with means for rotating said shield about a common axis

of said envelope and said anode for sweeping a filiform pencil of X-ray radiation derived from said beam across a patient juxtaposed with said second portion of said envelope:

a transducer responsive to X-ray radiation spaced from said second portion and intercepting the portion of said pencil of X-ray radiation traversing the patient, producing signals adapted to generate a television display; and

means responsive to said signals and synchronized with the rotation of said shield for displaying a series of points representing a tomographic image of the patient.

4,234,795

APPARATUS FOR LOADING AND UNLOADING CONTAINERS FOR X-RAY FILM

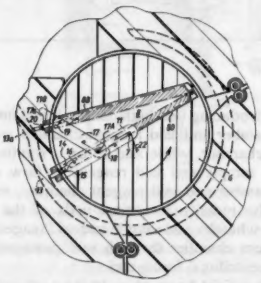
Jürgen Müller, Münich, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Munich, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,120

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2758981

Int. Cl.³ G11B *1/00*

U.S. Cl. 250—468 **10 Claims**



1. Apparatus for inserting photosensitive material into and for withdrawing such material from normally locked and closed containers, particularly for removing exposed sheets of X-ray film from and for introducing unexposed sheets of X-ray film into cassettes, comprising a housing having an internal chamber and an opening for insertion and withdrawal of containers, said opening communicating with said chamber; a rotary carrier sealingly installed in said chamber for rotation from a first to a second and a third angular position and then again to said first angular position and having a compartment with an open end which registers with said opening in said first angular position of said carrier so that a container can be inserted into or withdrawn from said compartment when said carrier assumes said first position; unlocking means for maintaining a container in said compartment in its open position only while said open end is so completely out of register with said opening that outside light reaching the latter is prevented from entering said compartment through said open end thereof; means for receiving photosensitive material from a container in said compartment in said second angular position of said carrier; and means for admitting photosensitive material into a container in said compartment in said third angular position of said carrier.

4,234,796

FILM CHANGER FOR X-RAY APPARATUS

Jean Caugant, and Jacques Dale, both of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

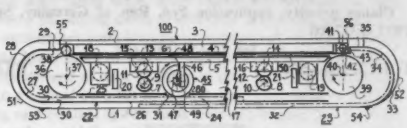
Filed Jun. 21, 1979, Ser. No. 50,583

Claims priority, application France, Jun. 23, 1978, 78 18837

Int. Cl.³ G03B *41/16*

U.S. Cl. 250—468 **19 Claims**

1. A film changer for an X-ray apparatus including within a light-tight casing a supply magazine for holding a stack of unexposed film in sheets, means for extracting a single sheet from said stack, an exposure station having two parallel pressure plates respectively covered on their adjacent faces by intensifying screens, one being fixed and the other reciprocably movable toward and away from said fixed one, means for transferring the extracted sheet between said pressure plates



when apart, means for ejecting the film sheets after their exposure from said exposure station, and a receiver magazine for holding the exposed film sheets, wherein the extracting means comprise means for coupling it to the movable pressure plate so that its sole displacement away from said fixed plate actuate the extraction of a film sheet and its presentation to the transferring means.

4,234,797

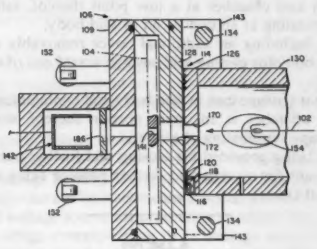
TREATING WORKPIECES WITH BEAMS

Geoffrey Ryding, Manchester, Mass., assignor to Nova Associates, Inc., Beverly, Mass.

Filed May 23, 1979, Ser. No. 41,806

Int. Cl.² A61K *27/02*

U.S. Cl. 250—492 B **16 Claims**



1. In apparatus for treating a workpiece by directing a beam at the workpiece, said apparatus being of the type including a moving support element for carrying said workpiece in a scanning direction, second means for providing relative translation between said support surface and said beam in a control direction generally orthogonal to said scanning direction, measuring means for measuring the intensity of said beam, control means for varying the speed of translation in said control direction, the improvement wherein

said support surface has a slot extending generally along said control direction,

said beam measuring means comprises means positioned behind said support element for measuring the intensity of said beam travelling through said slot, and

said control means comprises means for varying the speed of translation in said control direction in dependent response to said measured beam intensity travelling through said slot.

4,234,798
TRANSPORT AND STORAGE RECEPTACLE FOR RADIOACTIVE WASTE

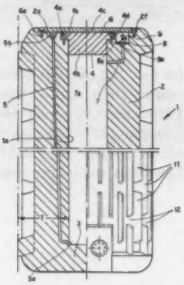
Henning Baatz, Essen, and Dieter Rittscher, Heiligenhaus, both of Fed. Rep. of Germany, assignors to Steag Kernenergie GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 6, 1978, Ser. No. 940,098

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 7727690

Int. Cl.[2] G21F *5/00*

U.S. Cl. 250—506 **8 Claims**



1. A shielding transport and storage receptacle for radioactive materials, especially for nuclear-reactor fuel elements, comprising:

an elongated body cast in one piece and formed with a lateral wall surrounding a chamber for said material and a bottom, said body being composed of cast iron or cast steel;

a shielding cover connected to said body and closing said chamber at an upper end thereof with a thickness of radiation absorbing material limiting escape of radiation into the environment,

at least one passage cast in said body and communicating with said chamber at a low point thereof, said passage terminating at an upper end of said body;

means including an additional cover removably affixed to said body for closing said passage at said end of said body; and

a further passage cast in said body and communicating with said chamber at an upper portion thereof, said further passage terminating at said end,

means being provided for closing said further passage,

the means for closing said further passage being said additional cover.

4,234,799
METHOD AND INSTRUMENT FOR PHOTOMETRIC ANALYSIS OF LIQUID USING CENTRIFUGE ROTOR

Akira Okumura, Takarazuka, Japan, assignor to Tetsuo Matsumoto, Hyogo; Eiko Okumura, Takarazuka and Hitachi Koki Company, Limited, Tokyo, all of, Japan

Filed Dec. 12, 1978, Ser. No. 968,722

Claims priority, application Japan, Dec. 16, 1977, 52-152248

Int. Cl.[3] G01K *15/06*

U.S. Cl. 250—576 **9 Claims**

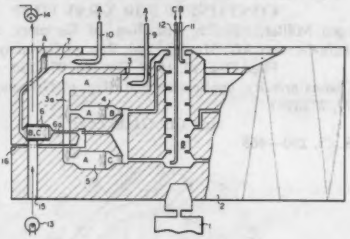
1. A method of photometrically analyzing a liquid mixture of a sample and a reagent, comprising the steps of:

(a) forming in a centrifuge rotor a sample chamber, a reagent chamber and a reservoir chamber each elongated and oriented radially of said rotor in such a fluidic connection that said reservoir chamber communicates with both said sample chamber and said reagent chamber through the radially outermost ends thereof;

(b) forming in said rotor a light-transmissive measurement chamber which is elongated, oriented radially of said rotor and located radially outward from said sample chamber and said reagent chamber and a passageway which connects said measurement chamber to the radially innermost ends of said sample chamber and said reagent chamber;

(c) introducing a high density liquid which is higher in density than either of said sample and said reagent into both said sample chamber and said reagent chamber through said reservoir chamber so as to leave said sample chamber and said reagent chamber each partly vacant;

(d) introducing a liquid sample into said sample chamber through the radially innermost end thereof and introducing a liquid reagent into said reagent chamber through the radially innermost end thereof while said rotor is rotating;



(e) further introducing said high density liquid into both said sample chamber and said reagent chamber through said reservoir chamber, while said rotor is rotating, so as to force said sample and said reagent to flow out of said sample chamber and said reagent chamber, respectively, through the radially innermost ends of the respective chambers, whereby said sample and said reagent enter said measurement chamber through said passageway by the action of centrifugal force; and

(f) projecting a light beam so as to intersect said measurement chamber and receiving and analyzing the light beam transmitted through said measurement chamber, in which is contained a mixture of said sample and said reagent.

4,234,800
OZONE GENERATOR

William L. Kenly, V, Parsippany; William O. Grefe, West Paterson, and Walter H. Lawrence, Hopatcong, all of N.J., assignors to Pollution Control Industries, Inc., West Caldwell, N.J.

Filed Jan. 29, 1979, Ser. No. 7,557

Int. Cl.[3] C01B *13/11*

U.S. Cl. 250—540 **10 Claims**

1. In an ozone generator comprising an inner tubular metallic electrode, an outer electrode comprising a tubular dielectric having on its outer surface an outer metal electrode, said dielectric and said inner electrode defining a corona discharge ozone generation zone, and means for contacting the outer surface of said outer electrode with a cooling fluid, and two end members cooperating with said inner and outer electrodes to form a unitary module, the improvement wherein:

(a) The longitudinal dimension of said outer tubular dielectric is greater than the longitudinal dimension of said tubular metallic electrode;

(b) Each of said end members comprises an end plate having:

(1) On the inner surface thereof a first projection for receiving in slidably engaging, fluid-tight contact said tubular dielectric;

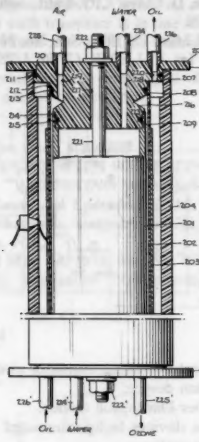
(2) On the inner surface of said first projection, a second projection for receiving in slidably engaging fluid-tight contact said inner electrode;

(3) The side wall of said second projection being provided with a circumferential recess extending therearound, and in fluid communication with the annulus between said inner electrode and said dielectric;

(c) Said end member being further provided with:

(1) A passage extending from said circumferential recess to the outer face of said end member for transmitting oxygen-containing gas between said annulus and the outside of said module; and

(2) A passage extending from the inner face of said projection to the outer face of said end member for transmitting cooling fluid between the core of said inner cylinder and the outside of said module.



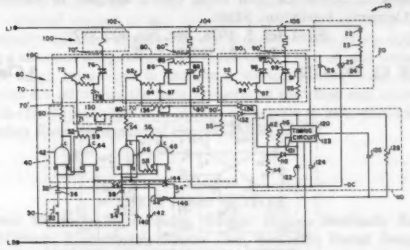
(d) Means for securing end members being secured by applying to said members an axial compressive force, the axial dimensions of said end members, said tubular metallic electrode and said outer tubular dielectric being such that substantially all of said axial compressive force is applied to said tubular metallic electrode and said tubular dielectric is free to slide longitudinally and is not subjected to said axial compressive force.

4,234,801

CONTROL SYSTEM UTILIZING MOMENTARY SWITCHING DEVICES

James E. Small, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Feb. 22, 1978, Ser. No. 880,089
Int. Cl.³ H02J *3/00*
U.S. Cl. 307—38 **5 Claims**



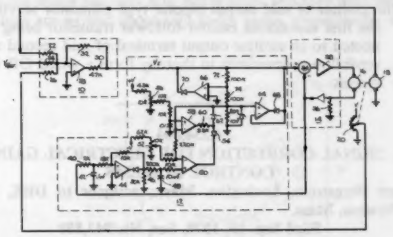
1. In an apparatus having a plurality of machine functions and a control system for controlling activation and deactivation of said machine functions, said control system including programming means having N momentary switching devices for programming desired operational modes of said apparatus and function control means for activating and deactivating said machine functions in accordance with predetermined operational sequences associated with said operational modes, the improvement wherein said control system further comprises: gate circuit means responsive to said N momentary switching devices for latching said control system in at least N+1 operational modes, said gate circuit means including at least two bistable multivibrator circuits and each of said bistable multivibrator circuits includes a plurality of multiple input inverting logic gates each having an output electrically coupled to an input of at least one other of said logic gates, at least N of said inverting logic gates have inuts electrically coupled to said momentary switching devices whereby activating any one of said N momentary switching devices causes at least one of said inverting logic gates to make a logical one (1) to logical zero (0) transition and at least another of said inverting logic gates to make a logical zero (0) to logical one (1) transition thereby latching said control system in at least one of said N+1 operational modes, said function control means responsive to said gate circuit means whereby said machine functions are activated and deactivated in accordance with said predetermined operational sequences, and timing means responsive to said function control means for determining timing cycles for operational sequences of at least N of said N+1 operational modes.

4,234,802

CURRENT LIMITER

Francis X. Bock, New Hyde Park, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Sep. 11, 1978, Ser. No. 941,011
Int. Cl.³ H04B *15/00*
U.S. Cl. 328—171 **5 Claims**



1. A current limiter for independently limiting both the peak current and average current of a transconductance switching servo amplifier by clamping the input voltage of said amplifier, comprising:

(a) peak current limit set means adapted for connection to a fixed voltage source for producing an adjustable peak limit voltage corresponding to a peak current limit;

(b) average current limit set means adapted for connection to a fixed voltage source for producing an adjustable average limit voltage corresponding to an average current limit;

(c) averaging means for producing an average voltage corresponding to the average current of said amplifier; and

(d) clamping means connected to said peak current limit set means, to said average current limit set means and to said averaging means for clamping said amplifier input voltage to said adjustable peak limit voltage when said input voltage tends to exceed said adjustable peak limit voltage or when said average voltage exceeds said adjustable average limit voltage.

4,234,803

INTEGRATED LOGIC CIRCUIT ARRANGEMENT

Terumoto Nonaka, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

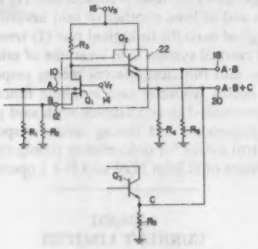
Filed Apr. 24, 1978, Ser. No. 899,588
Claims priority, application Japan, Apr. 30, 1977, 52-50258
Int. Cl.³ H03K *19/094, 19/20, 19/21*
U.S. Cl. 307—218 **11 Claims**

1. An integrated logic circuit arrangement comprising:

an input junction field effect transistor having at least one

source for receiving a digital input signal, a drain to which a load is connected, and a gate held at a fixed DC reference potential, said junction field effect transistor being operative to effect switching operation in accordance with said digital input signal, said load being adapted for connection between said drain and a power source;

an output bipolar type transistor having its base connected to said drain to effect switching operation in accordance with an output signal delivered from said drain;



said output bipolar type transistor having a load connected to the emitter of said output bipolar transistor, whereby said output bipolar transistor behaves as an emitter-follower transistor; and

a second emitter-follower transistor,

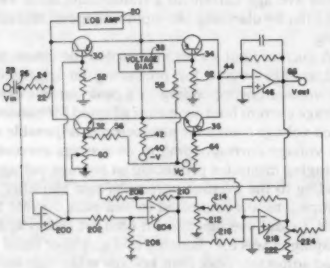
the emitter of said output bipolar type transistor serving as the first mentioned emitter-follower transistor being connected to an emitter output terminal of said second emitter-follower transistor to thereby form a wired OR logic circuit.

4,234,804

SIGNAL CORRECTION FOR ELECTRICAL GAIN CONTROL SYSTEMS

Gary Bergstrom, Lexington, Mass., assignor to DBX, Inc., Newton, Mass.

Filed Sep. 19, 1978, Ser. No. 943,859
Int. Cl.³ G06G *7/12, 7/24*
U.S. Cl. 307—229 **16 Claims**



1. In an electrical gain control system including first signal converting means for providing at its output a first output signal logarithmically related to an input signal; means coupled with respect to the output of said first signal converting means for summing a gain control signal with said first output signal; and second signal converting means for providing at its output a second output signal which is an anti-logarithmic function of the sum of said first output signal and said gain control signal, the improvement comprising:

signal generating means for comparing said input signal and said second output signal and for generating, in response to said comparison, an error correction signal as a function of the distortion in said second output signal; and

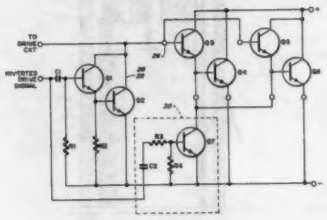
means coupled with respect to the output of said first signal converting means for summing said error correction signal with said first output signal and said gain control signal so as to reduce said distortion in said second output signal.

4,234,805

CIRCUIT AND METHOD FOR PARALLELING POWER TRANSISTORS

George D. Carlsen, II, Culver City, Calif., assignor to EVC, Inc., Inglewood, Calif.

Filed Mar. 15, 1978, Ser. No. 886,716
Int. Cl.³ H03K *17/60, 3/26*
U.S. Cl. 307—254 **11 Claims**



1. A high-current switching transistor circuit comprising:

a first Darlington device;

at least one other Darlington device;

said Darlington devices being connected in a parallel pin-for-pin configuration;

drive source means for driving said Darlington devices said drive source means being directly connected to an input common base connection of all of said Darlington devices;

first pull-down circuit means connected to said common base connection of the Darlington devices to reduce the storage time of power transistor in said Darlington devices;

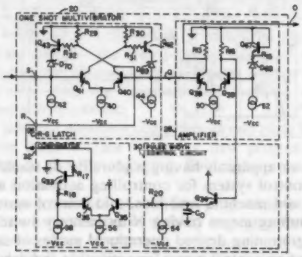
at least one other pull-down circuit means connected to a base to emitter connection in each Darlington device for synchronizing the turn-off times of said Darlington devices while further reducing the storage time of said power transistors.

4,234,806

MONOSTABLE MULTIVIBRATOR EMPLOYING NONSATURATING SWITCHING TRANSISTOR

James C. Schmoock, San Jose, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 5, 1978, Ser. No. 922,397
Int. Cl.³ H03K *3/284*
U.S. Cl. 307—273 **9 Claims**



1. A one shot multivibrator, comprising:

(a) a bistable circuit means adapted to be placed selectively in either a first stable condition in response to a trigger

signal or in a second stable condition in response to a reset signal;
(b) a transistor;
(c) means for enabling the transistor to be placed in either a conducting state or a nonconducting state selectively in accordance with the stable condition of the bistable circuit means while preventing forward-biasing of a base-collector junction of such transistor when such transistor is in the conducting state and for enabling a capacitor to discharge when such transistor is in one state and to charge at a predetermined rate when the transistor is in the other state; and
(d) means for producing the reset signal when the capacitor charges to a predetermined level.

4,234,807

LADDER DEVICE WITH WEIGHTING FACTOR ADJUSTING MEANS

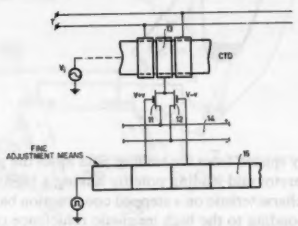
Leonard J. M. Esser, and Ludovicus G. M. Heldens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,765

Claims priority, application Netherlands, Mar. 8, 1977, 7702452

Int. Cl.³ H03L *1/00*

U.S. Cl. 307—304 **6 Claims**



1. A ladder device comprising at least three ladder sections each having an input and an output, first means for coupling said ladder sections in cascade via said inputs and outputs, second means for coupling a signal input terminal to at least one input of said ladder sections, a signal output terminal coupled to an output of at least one ladder section, weighting-factor adjusting means coupled to an input of at least one ladder section, said weighting-factor adjusting means comprising first and second field-effect transistors each having a main electrode connected to said input of said one ladder section, the channel regions of said first and second transistors having mutually different predetermined length-to-width ratios defining a selected weighting factor coefficient, both of said transistors being integrated in the same semiconductor body, and means for adjusting the gate voltages of said first and second field-effect transistors as a voltage difference so as to provide a further fine adjustment of the weighting factor.

4,234,808

STEPPING MOTOR

Klaus Geppert, Friesenheim; Günter Heine, Seelbach; Karl Hübner, Kippenheim; Günter Ose, Seelbach; Bernd Seeger, Lahr; Claus Schäffer, Friesenheim, and August Spiesberger, Lahr, all of Fed. Rep. of Germany, assignors to Gerhard Berger GmbH & Co. Fabrik Elektrischer Messgerate, Lahr, Fed. Rep. of Germany

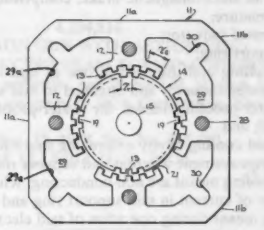
Filed Sep. 2, 1977, Ser. No. 830,124

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703791

Int. Cl.³ H02K *37/00*

U.S. Cl. 310—49 R **11 Claims**

1. In a stepping motor of the homopolar design and having a housing, a shaft journaled in the housing, a rotor secured to the shaft, and a stator connected with the housing and concentrically surrounding the rotor with a working air gap therebetween, wherein the stator is a layered steel structure with a plurality of radially inwardly extending poles for the respective field windings and each of the stator poles is provided on the end face thereof at the working air gap with a plurality of stator pole teeth at a uniform pitch, insulation means is provided for covering the stator poles so as to isolate the field windings electrically therefrom, the rotor includes an axially magnetized permanent magnet and two magnetically conductive annular steel members sandwiching the magnet therebetween and provided on their circumferential faces at the working air gap with respective identical sets of rotor teeth at a uniform pitch but with the rotor teeth on each annular member offset by a half pitch with respect to the rotor teeth on the other annular member, the shaft is magnetically non-conductive, and the housing includes a pair of magnetically non-conductive bearing bells; the improvement comprising that:
(a) the stator is a single-section hollow structure devoid of an external yoke for the magnetic return in the axial direction and has a generally square transaxial shape with straight sides and slightly rounded or chamfered corners;
(b) each of the two bearing bells has a transaxial shape the same as that of the stator, and means are provided for securing the bearing bells to the stator at the respective opposite faces of the latter and in alignment with the stator and each other to provide the motor with a generally cubic form;
(c) the stator has only four stator poles and four field windings are wound about said stator poles, respectively, and



each of the stator poles extends from the middle region of a respective one of the four straight sides of the stator and has four or five stator pole teeth;
(d) the pitch of the rotor teeth is expressed by the relation $\tau_r = 360°/Z_r$ and the pitch of the stator pole teeth by the relation $\tau_s = 360°/Z_s = 360°/(Z_r - 1 \pm k)$, where Z_r is the number of rotor teeth, Z_s is the theoretical number of stator pole teeth consisting of the sum of the actual number of stator pole teeth plus the number of such teeth omitted between adjacent stator poles and must be divisible by 4, k is an even integer with $0 \leqq k \leqq 6$, and for a given value of either Z_r or Z_b, k is so chosen that the step angle of the motor is about 3.6°;
(e) the permanent magnet of the rotor is a thin ring disc structure of a highly coercive magnetic material with an energy density $(B \times H)_{max} \geqq 10$ MGOe and a ratio of disc diameter to disc thickness ranging from about 4 to about 20;
(f) the two annular members on which the rotor teeth are provided are ring disc structures which are of somewhat greater diameter than the permanent magnet and on their sides facing each other and the magnet are provided with respective axial projections beveled inwardly at an angle of about 30°–60° down to the outer circumference of the magnet; and
(g) the insulation means is a composite annular structure consisting of two unitary annular sections fitted into the stator from opposite sides thereof and covering all parts of the stator poles except the toothed end faces thereof, the

insulation structure being of such configuration as to leave between adjacent stator poles respective wire winding gaps each not less than 2 mm wide.

4,234,809

ELECTROMAGNETIC BRAKE

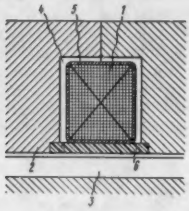
Nikolai A. Burenkov, ulitsa Molostovykh, 2, korpus 2, kv. 54; Rikhard A. Ioganson, Kutuzovsky prospekt, 4, kv. 6; Mark B. Perchenok, ulitsa Chasovaya, 27/12, kv. 16; Alexandr V. Kuprianov, Chuxin tupik, 5, kv. 73; Evgeny V. Chegodaev, ulitsa Novgorodskaya, 34, kv. 317, and Valentin I. Chulin, ulitsa Novo-Petrovskaya, 18, kv. 49, all of Moscow, U.S.S.R.

Filed Jul. 31, 1978, Ser. No. 929,440

Claims priority, application U.S.S.R., Aug. 31, 1977, 2512802

Int. Cl.³ H02K *49/02*

U.S. Cl. 310—105 **1 Claim**



1. In an electromagnetic brake, comprising:

an armature;

a serrated inductor;

a support ring;

an exciting coil disposed in one of said armature and said serrated inductor and attached to said support ring;

a water-proofing means for water-proofing said exciting coil; and

a liquid cooling cavity embracing said exciting coil;

the improvement wherein said support ring and said water-proofing means are non-conducting, whereby the production of current in said support ring and said water-proofing means during operation of said electromagnetic brake is precluded.

4,234,810

CONCENTRATED WINDING SALIENT-POLE SHADED POLE MOTORS HAVING MULTIPLE SHORT CIRCUITED SHADING COILS FOR EACH POLE AND METHODS OF MAKING SAME

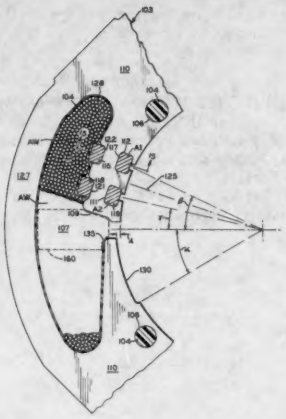
Joe T. Donahoo, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 688,251, May 20, 1976, Pat. No. 4,131,814, which is a continuation-in-part of Ser. No. 293,802, Oct. 2, 1972, Pat. No. 3,959,678. This application Jun. 2, 1978, Ser. No. 912,052

Int. Cl.³ H02K *17/10*

U.S. Cl. 310—172 **15 Claims**

1. A shaded pole motor comprising a stator assembly, a rotor assembly including a short circuited squirrel cage winding, and means for supporting the rotor assembly in spaced apart air gap defining relation with the stator assembly and for permitting rotation of the rotor assembly relative to the stator assembly during excitation of said winding; said stator assembly including a magnetizeable core having circumferentially spaced apart pole pieces having leading and trailing pole tips and being interconnected by yoke sections and defining with said yoke sections windows for winding conductors; said stator assembly further comprising an excitable winding disposed about one of the pole pieces and having side turn portions disposed in a first winding window between the yoke section and the trailing pole tip of said one of the pole pieces; said first winding window having an area for accommodating a predetermined maximum cumulative cross-sectional area AW of winding conductor; said one of the pole pieces having the leading pole tip thereof configured to establish a relatively high magnetic reluctance therealong, as compared to another region of such pole piece; said one of the pole pieces also having at least two short circuited shading coils disposed along the trailing pole tip thereof at a first large span and a second short span, respectively, and having cross-sectional current carrying areas of A1 and A2, respectively; and said pole pieces being spaced apart magnetically so that the leading pole tip of each pole piece is



magnetically spaced from the trailing pole tip of the pole piece adjacent thereto; said leading pole tip having a high magnetic reluctance characteristic on a stepped construction basis generally corresponding to the high magnetic reluctance characteristic of a stepped pole piece having a step of a preselected span in a predetermined range, and said first large span comprising a span in the range of from about fifty percent of the preselected span to less than sixty electrical degrees; said area A1 being at least equal to said area A2; and said area A1 being approximately equal to from about ten to fifteen percent of said area AW.

4,234,811

SUPPORTING STRUCTURE FOR A THICKNESS-SHEAR TYPE CRYSTAL OSCILLATOR FOR WATCHES

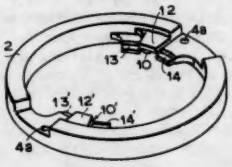
Hiroshi Hishida, Sayama; Toshihiko Nakayama, Tokorozawa; Isao Koyama, Kodaira, and Hisao Wakabayashi, Higashikurume, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,303

Claims priority, application Japan, Jan. 14, 1977, 52-3462

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—348 **1 Claim**



1. A supporting structure for a thickness-shear type crystal oscillator for watches comprising:

(a) a crystal piece having a peripheral notch therein;

(b) a resilient supporting frame for firmly supporting said crystal piece;

(c) a plurality of tongues spaced apart from each other and arranged side by side along the inner periphery of said resilient supporting frame and including grooves formed therebetween in which circumferential portions of said crystal piece are located; and

(d) an integral projection provided on at least a specific one of said tongues for engaging the notch of said crystal piece whereby said tongues prevent axial movement of said crystal piece and said projection prevents rotational movement of said crystal piece;

wherein

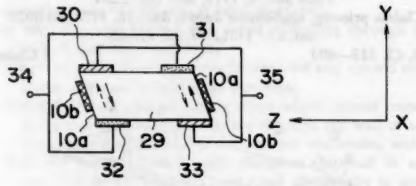
(e) said projection is perpendicular to said specific one of said tongues and extends between and is located between adjacent side by side tongues associated with said specific one of said tongues.

4,234,812

THICKNESS-WIDTH SHEAR QUARTZ CRYSTAL VIBRATOR

Hirofumi Kawashima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jul. 28, 1978, Ser. No. 929,027
Claims priority, application Japan, Dec. 7, 1977, 52/146735
Int. Cl.³ H01L *41/08, 41/18*
U.S. Cl. 310—361 **5 Claims**



1. A thickness-width shear quartz crystal vibrator cut out from the a Y-plate of quartz crystal at the angle of 34 to 36 degrees truned around the X'-axis thereof, wherein respective pairs of spaced electrodes are respectively provided on the main surfaces thereof which are penpendicular to the Y'-axis thereof, said spaced electrodes provided on each main surface having a different polarity and spaced in the width dimensions of the vibrator, and frequency-adjusting elements adhered to the side surfaces on which said electrodes not being provided; and the width-to-thickness ratio Yo/Zo thereof is less than 0.3, where Yo is the thickness of the vibrator and Zo is the width of the vibrator.

4,234,813

PIEZOELECTRIC OR PYROELECTRIC POLYMER INPUT ELEMENT FOR USE AS A TRANSDUCER IN KEYBOARDS

Heishaburo Iguchi, Kamakura, and Hiroji Ohigashi, Zushi, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 10, 1979, Ser. No. 28,822
Claims priority, application Japan, Apr. 10, 1978, 53/41981
Int. Cl.³ H01L *41/08, 41/18*
U.S. Cl. 310—366 **7 Claims**

1. An input element for use as a transducer in keyboard comprising:

a supporting plate,

a plurality of stimulus-receiving portions provided on said supporting plate,

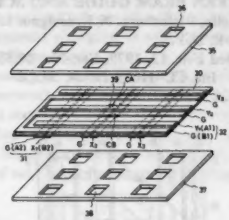
a first signal-detecting electrode (A1) and a front-face earthing electrode (B1) provided mutually independently on the front face of each of said stimulus-receiving portions,

a back-face earthing electrode (A2) and a second signal-detecting electrode (B2) provided mutually independently on the back face of each of said stimulus-receiving portions,

said first signal-detecting electrode (A1) being disposed corresponding to said back-face earthing electrode (A2),

said second signal-detecting electrode (B2) being disposed corresponding to said front-face earthing electrode (B1),

a portion (CA) of each of said stimulus-receiving portions located between said first signal-detecting electrode (A1)



and said back-face earthing electrode (A2) being formed from polymeric material having piezoelectric or pyroelectric property, and

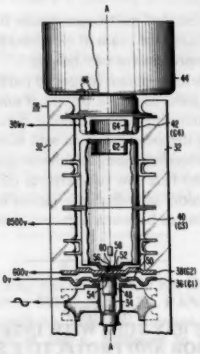
a portion (CB) of each of said stimulus-receiving portions located between said second signal-detecting electrode (B2) and said front-face earthing electrode (B1) being formed from polymeric material having piezoelectric or pyroelectric property.

4,234,814

ELECTRON GUN WITH ASTIGMATIC FLARE-REDUCING BEAM FORMING REGION

Hsing-Yao Chen, Landisville, and Richard H. Hughes, Lancaster, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,600
Int. Cl.³ H01J *29/50, 29/56*
U.S. Cl. 313—412 **12 Claims**



1. A cathode ray tube comprising an image screen and an electron gun for projecting an electron beam onto said screen, said gun comprising:

a cathode, a control grid, a screen grid, and electron lens means adapted to focus electrons from said cathode onto said screen,

said screen grid comprising a first plate portion which is transverse to said beam path and which contains a circular electron beam aperture therethrough, and a second plate portion flush with said first plate on the side thereof facing said cathode which may be either attached to or integral

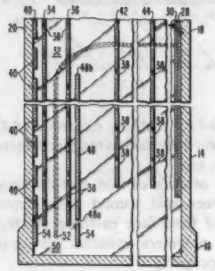
with said first plate portion, and which contains a slot therethrough into which said electron beam aperture opens.

4,234,815

FLAT DISPLAY TUBE HAVING SHIELDING MEMBER BETWEEN BEAM GUIDE AND SCREEN

Thomas L. Credelle, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,555
Int. Cl.³ H01J *29/04, 31/08*
U.S. Cl. 313—422 **2 Claims**



1. In a display device having an evacuated envelope with substantially parallel front and back walls,

a cathodoluminescent screen on the front wall,

an electron beam guide in spaced relation to said back wall, said beam guide being disposed substantially parallel to said screen, said beam guide comprising a pair of spaced apart, elongated guide grids having a plurality of apertures therethrough, said apertures being arranged so as to define a plurality of rows across and columns along said guide grids,

means at one end of said beam guide for generating and directing at least one beam of electrons between said guide grids, the improvement comprising:

conductive shielding means in spaced parallel relationship to said beam guide having a proximal end adjacent to said electron generating and directing means, said shielding means being disposed between said screen and said beam guide and extending along said beam guides so as to overlap at least the first row of apertures on the screen side of said beam guide, said shielding means having a distal end which terminates between adjacent rows of apertures.

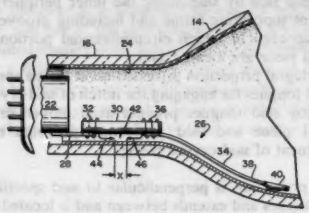
4,234,816

CATHODE RAY TUBE WITH INTERNAL ARC SUPPRESSOR AND PROTECTIVE SPARK GAP

Martin Fischman, Seneca Falls, N.Y., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 16, 1979, Ser. No. 30,417
Int. Cl.³ H01J *29/88, 29/94, 29/96*
U.S. Cl. 313—479 **2 Claims**

1. In a cathode ray tube including a high resistance coating on the interior thereof, an electron gun having a plurality of axially aligned electrodes having varying spaces therebetween and an antenna getter mounted upon the final one of said electrodes, said antenna getter being substantially electrically insulated from said final electrode by a resistor, the improvement comprising: a spark gap across said resistor defining a sparking potential greater than the sparking potential existing between any adjacent pair of electrodes of said electron gun at



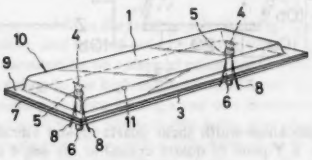
normal operating tube voltages and lower than that inherently existing across said resistor.

4,234,817

FLAT TYPE FLUORESCENT LAMP

Toru Teshima, Yokohama; Kazuo Ariga, Tokyo, and Mitunari Yoshida, Yokohama, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1979, Ser. No. 1,284
Claims priority, application Japan, Jan. 26, 1978, 53-8029
Int. Cl.³ H01J *61/30, 61/42*
U.S. Cl. 313—493 **4 Claims**



1. A flat type fluorescent lamp comprising:

a molded plate glass member in the shape of an upside-down dished generally rectangular plate and having a peripheral joining edge, said dished glass member having a dished light emitting surface;

a generally rectangular flat plate glass member having a peripheral joining edge overlapping the peripheral joining edge of said dished glass member, said peripheral joining edges of said glass members being sealingly joined together with said flat glass member below said upside-down dished glass member to form a hollow flat type fluorescent lamp body, said flat glass member having a pair of holes extending generally perpendicularly through flat surface portions thereof, said holes being located at opposite ends of said hollow lamp body and spaced inwardly from said peripheral joining edge;

a pair of electrodes mounted to said flat glass member in the vicinity of respective holes in said flat glass member and being spaced from said flat glass member in a direction substantially perpendicular to the surface of said flat glass member, said pair of electrodes being sealed in said fluorescent lamp body; and

a respective pair of electrical conductors connected to and supporting each of said electrodes and passing through respective holes in said flat glass member to extend generally perpendicularly to said flat glass member and to electrically connect said electrodes to the outside of said lamp body.

4,234,818

ELECTRIC MIXED LIGHT LAMP

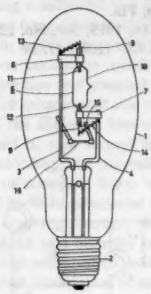
Willy L. J. Engelen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 22, 1979, Ser. No. 22,746

Claims priority, application Netherlands, Apr. 17, 1978, 7804040

Int. Cl.³ H01J *7/44*

U.S. Cl. 315—49 **1 Claim**



1. An electric mixed light lamp which comprises:
a single vacuum-tight sealed lamp envelope,
at least first and second pole wires extending through the wall of said lamp envelope,
a high pressure discharge tube having first and second electrodes disposed in said lamp envelope,
first and second current supply wires which extend respectively in a vacuum-tight manner through the wall of said discharge tube to said first and second electrodes, and
first and second incandescent filaments disposed in said envelope which are each connected electrically in series mutually and with said discharge lamp, each of said filaments being a coiled-coil filament, said first filament being stretched between said first pole wire and said first current supply conductor, said second filament being stretched between and fixed to said second pole wire and said second current supply conductor.

4,234,819

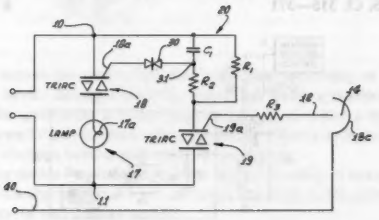
UNDERWATER LIGHT CIRCUIT AND INSTALLATION

Eugene R. Maxey, Valinda, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed Jun. 14, 1979, Ser. No. 48,548

Int. Cl.³ H05B *39/04*; F21V *31/00*

U.S. Cl. 315—119 **9 Claims**



1. In an underwater light circuit, the combination comprising
(a) first and second terminals across which AC power is applicable, and a ground connection,
(b) a pair of electrodes exposed for contact with the water, one electrode electrically connected with the first of said terminals, and the other electrode connection with said ground connection,
(c) a network including resistance and capacitance connected in series between said one electrode and said first terminal,
(d) an electric lamp having a filament, and a first gate controlled switch connected in series with the filament between said first and second terminals,
(e) said network electrically connected with the gate of said first switch to effect turn-on of said first switch in response to predetermined charging of said capacitance to predetermined voltage level,
(f) and a second gate controlled switch connected in series with said network, said one electrode connected with the gate of said second switch to effect turn-on of said second switch when current passes between said electrodes, thereby to effect current flow between said terminals and charging of said capacitance to said voltage level.

4,234,820

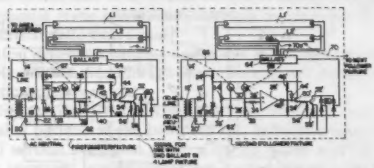
LIGHT REGULATION SYSTEM

Don F. Widmayer, Bethesda, Md., assignor to Controlled Environments Systems, Rockville, Md.

Continuation-in-part of Ser. No. 945,842, Sep. 26, 1978. This application Apr. 6, 1979, Ser. No. 27,740

Int. Cl.³ H05B *41/38*

U.S. Cl. 315—152 **7 Claims**



1. A light regulation system for controlling the output of at least one lamp in a follower fixture in accordance with the light output of a master fixture containing at least one lamp, said lamps comprising arc discharge lamps and said lamp units each comprising a ballast for the at least one lamp and a control device for controlling the ballast and hence the light output of the at least one lamp, said system comprising optical-electrical transducer means in the control device of said follower fixture for controlling the output of the control device of the follower fixture in accordance with the light input received thereby, and light collecting and coupling means for collecting the light output of the at least one master lamp and for coupling the said output of said at least one master lamp to said optical-electrical transducer means.

4,234,821

FLAT PANEL TELEVISION RECEIVER IMPLEMENTED WITH A THIN FILM EL PANEL

Noritoshi Kako, Kashihara; Yasukuni Yamane, Tenri, and Chuji Suzuki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1978, Ser. No. 941,202

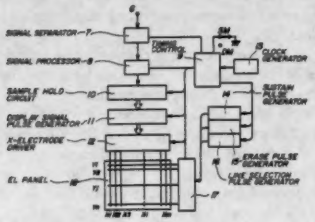
Claims priority, application Japan, Sep. 14, 1977, 52/110898; Sep. 17, 1977, 52/112009; Sep. 19, 1977, 52/113091; Sep. 26, 1977, 52/116206; Sep. 30, 1977, 52/118073; Sep. 30, 1977, 52/118076

Int. Cl.² H04N *5/70*; H05B *33/08*

U.S. Cl. 315—169.3 **13 Claims**

4. A television receiver comprising:
a television image screen including a thin-film electroluminescent panel having hysteresis properties in the applied voltage vs brightness characteristics; and
means for selectively enabling said thin-film electrolumines-

cent panel to display an image in either a normal moving picture mode or a steady picture mode, said image not



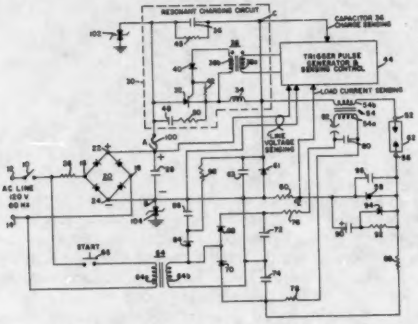
moving when said panel displays said image in steady picture mode.

4,234,822

CONTROL CIRCUIT PROVIDING CONSTANT POWER SOURCE

Robert L. Garrison, Henniker, N.H., and James C. Morris, Wakefield, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 3, 1978, Ser. No. 902,456
Int. Cl.³ H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **14 Claims**



1. A circuit for controlling the power applied to a load means from a source of alternating current line voltage comprising, in combination:

a full wave rectifying means having input means for connection to said source of alternating current and a pair of direct current output terminals;

a pair of supply terminals for connection to said load means;

a resonant charging circuit including a first unidirectional controlled switch means and having input and output terminals, said intput terminal being connected to a first one of the output terminals of said full wave rectifying means;

an averaging filter means connected between the output terminal of said resonant charging circuit and a first one of said supply terminals;

circuit means connecting a second one of the output terminals of said full wave rectifying means to a second one of said supply terminals;

a first diode means connected between said last-mentioned circuit means and said output terminal of said resonant charging circuit;

trigger pulse generating means coupled to said first unidirectional controlled switch means for intermittently operating the same; and

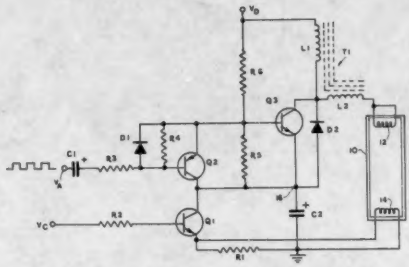
means connected across the first and second output terminals of said full wave rectifying means for sensing changes in said line voltage and adjusting the pulse rate of said trigger generating means in response thereto, whereby said resonant charging circuit maintains a source of constant power to a load connected to said supply terminals regardless of line voltage variations.

4,234,823

BALLAST CIRCUIT FOR LOW PRESSURE GAS DISCHARGE LAMP

Lincoln H. Charlot, Tampa, Fla., assignor to National Computer Sign Company, Tampa, Fla.

Filed Feb. 14, 1979, Ser. No. 12,234
Int. Cl.³ H05B *41/24*
U.S. Cl. 315—224 **8 Claims**



1. A ballast circuit for a low pressure gas discharge lamp having two filament-type electrodes at opposite ends of the lamp, comprising;

first means for providing a high AC voltage for application across opposite electrodes of the lamp;

a solid state controlled current source for providing a controlled current to the first means for enabling the first means to apply said AC voltage across said lamp electrodes to illuminate said lamp, wherein the voltage placed across said electrodes is non-sinusoidal; and

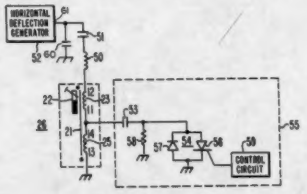
second means coupled to the first means for inhibiting said non-sinusoidal voltage from causing mercury migration in said lamp.

4,234,824

COMBINED LINEARITY AND SIDE PINCUSHION CORRECTION ARRANGEMENT

Willem den Hollander, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Apr. 23, 1979, Ser. No. 32,252
Claims priority, application United Kingdom, Jan. 10, 1979, 924/79
Int. Cl.³ H01J *29/70*
U.S. Cl. 315—371 **8 Claims**



5. A deflection circuit including a combined side pincushion and linearity correction magnetic structure, comprising:

a horizontal deflection winding;

a horizontal deflection generator coupled to said horizontal deflection winding for producing scanning current in said horizontal deflection winding;

a side pincushion correction modulator circuit; and

a combined side pincushion and linearity correction magnetic structure comprising:

a magnetic core, including first and second core portions;

a linearity winding wound around said first core portion and coupled to said deflection winding;

magnetic biasing means for generating a first bias magnetic flux in said first core portion and a second bias magnetic flux in said second core portion, said first bias magnetic flux establishing a magnetic bias in said first core portion near saturation for providing a linearity corrected scanning current in said horizontal deflection winding; and

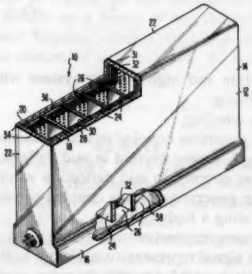
a side pincushion correction winding wound around said second core portion and coupled to said side pincushion correction modulator circuit and to said horizontal deflection winding, the magnetic bias of said second core portion established by said second bias magnetic flux being such as to enable said side pincushion correction winding to exhibit a substantially linear inductance of sufficient magnitude to provide substantial side pincushion correction to said scanning current, the amount of magnetic coupling between said linearity and side pincushion correction windings sufficient to compensate for an undesirable vertical rate modulation of said magnetic bias of said first core portion caused by said side pincushion corrected scanning current without substantially disturbing said side pincushion correction.

4,234,825

SYSTEM FOR CONTROLLING BRIGHTNESS UNIFORMITY IN DISPLAY DEVICES

Robert A. Gange, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 19, 1979, Ser. No. 31,461
Int. Cl.³ H01J *29/52*
U.S. Cl. 315—383 **9 Claims**



1. A system for controlling the brightness uniformity of a display device having a digitally controlled beam generating means for generating a plurality of electron beams, and a display screen for producing a visual display in response to impact by said electron beams, said system comprising:

sensing means for sensing a voltage from a plurality of beams which impinge on at least one sense electrode in the proximity of said display screen;

converting means for converting the sensed voltage to a control voltage; and

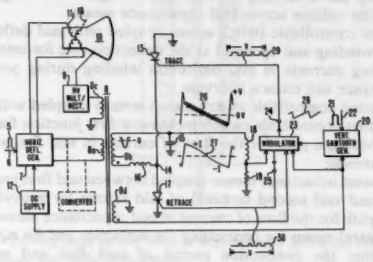
modifying means for modifying the beam generating means in response to said control voltage so as to compensate for non-uniform electron beam currents by varying the period of time during which electrons are generated by the beam generating means.

4,234,826

SYNCHRONOUS SWITCHED VERTICAL DEFLECTION DRIVEN DURING BOTH TRACE AND RETRACE INTERVALS

Wolfgang F. W. Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,784
Int. Cl.³ H01J *29/72*
U.S. Cl. 315—393 **17 Claims**



1. A deflection system for a cathode-ray tube, said deflection system comprising:

a horizontal deflection circuit for deflecting an electron beam of said tube in horizontal directions during alternate horizontal trace and retrace intervals in response to a recurrent deflection signal;

a vertical deflection winding responsive to a recurrent sawtooth current therethrough for deflecting said beam in a vertical direction; and

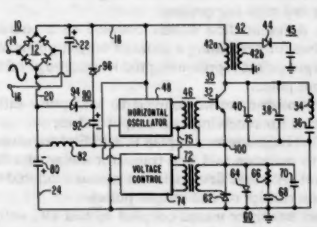
switched vertical deflection means for applying successively smaller portions of the energy of said deflection signal to said vertical deflection winding during a first interval of the recurrent vertical deflection cycle and successively greater portions of said energy of said deflection signal during a second interval of said recurrent vertical deflection cycle for producing said sawtooth current, said first and second intervals both occurring during the trace interval of said vertical deflection cycle, one of said first and second intervals occurring during said horizontal retrace intervals and the other of said first and second intervals occurring during said horizontal trace intervals.

4,234,827

REGULATED DEFLECTION CIRCUIT WITH REGULATOR SWITCH CONTROLLED BY DEFLECTION CURRENT

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 926,337, Jul. 20, 1978. This application Jul. 19, 1979, Ser. No. 58,659
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—408 **12 Claims**



1. A deflection circuit with switched regulator adapted for

operation from a source of unregulated direct voltage, comprising:

a deflection winding;

input inductance means serially coupled between a first terminal of said source and a first end of said deflection winding to form a first series circuit;

capacitance means coupled between a second end of said deflection winding and a second terminal of said source, the voltage across said first series circuit being regulated by the difference between said unregulated voltage and the voltage across said capacitance means;

first controllable switch means coupled with said deflection winding and operated at the deflection rate for establishing currents in said deflection winding during periodic trace and retrace intervals;

second controllable switch means serially coupled with said first controllable switch means at a first junction for providing a path for the flow of current in said first switch means;

second inductance means coupled between said first junction and said second terminal of said source for providing a path for the flow of current in said capacitance means; and

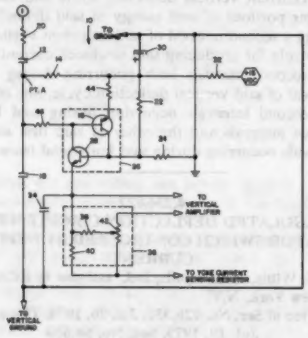
control means for controlling the deflection and for controlling the conduction period of said first and second switches in a manner to control the current flow in said capacitance means through said second inductance means and thereby maintain said regulated voltage substantially constant.

4,234,828

SELF-OSCILLATING SAWTOOTH CURRENT DEFLECTION GENERATOR

Lloyd E. Matthews, Berwyn, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 20, 1979, Ser. No. 77,434
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—408 **5 Claims**



1. A self-oscillating deflection generator for producing a sawtooth current waveform in a magnetic deflection coil of a cathode ray tube comprising:

pulse differentiation means coupled to a source of input pulses for generating a series of output pulses, each of said output pulses representing the leading edge of each of said input pulses;

first transistor means coupled to said pulse differentiation means for receiving said output pulses;

a DC voltage source coupled to said first transistor means so as to maintain said first transistor means at a first voltage level with said first transistor means rendered conductive upon receipt of said output pulses;

second transistor means coupled to said DC voltage source and to said first transistor means such that the current output of said first transistor means is connected to the input of said second transistor means with the current output of said second transistor means connected to the input of said first transistor means so as to form a regenerative, oscillatory network;

voltage divider means coupling said second transistor means with said DC voltage source so as to maintain said second transistor means at a second voltage level, said second voltage level being less than said first voltage level;

capacitor means coupled to said second transistor means such that said capacitor means is charged by the output of said second transistor means; and

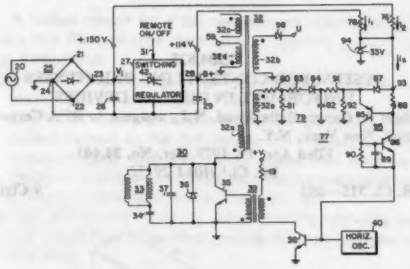
discharge means coupled to said capacitor means for discharging said capacitor means when said capacitor means becomes fully charged and said first and second transistor means stop conducting thereby generating a sawtooth current waveform.

4,234,829

HIGH VOLTAGE DISABLING CIRCUIT FOR A TELEVISION RECEIVER

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,839
Int. Cl.³ H01J *29/70*
U.S. Cl. 315—411 **6 Claims**



1. A deflection and high voltage system with a disabling circuit, comprising:

a deflection winding;

a deflection generator coupled to said deflection winding for generating scanning current in said deflection winding;

a transformer coupled to said deflection winding;

high voltage generating means coupled to said transformer for generating a high voltage;

detection means responsive to said high voltage for generating a first signal representative of high voltage;

a disabling latch coupled to said detection means and to said deflection generator for generating a disabling signal for disabling normal deflection generator operation upon energization of said latch by said detection means when said first signal exceeds predetermined values; and

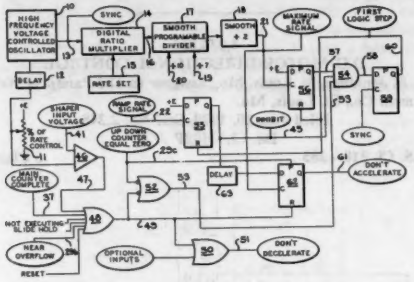
means coupled to said disabling latch for providing a sustaining current to said latch for maintaining said latch in a regeneratively conducting state upon latch energization;

wherein said sustaining current providing means includes a first source of voltage coupled to said disabling latch for providing a first component of said sustaining current to said latch, and a second source of voltage coupled to said disabling latch for providing a second component of said sustaining current to said latch, at least one of said first and second sustaining current components being by itself of insufficient magnitude to maintain said disabling latch in a regeneratively conducting state.

4,234,830
STEPPING MOTOR CONTROL CIRCUIT

Lee E. Cannon, Bozeman, Mont., assignor to Dana Corporation, Toledo, Ohio

Division of Ser. No. 731,867, Oct. 13, 1976, Pat. No. 4,126,821. This application Jan. 25, 1978, Ser. No. 872,276
Int. Cl.³ H23Q 5/10
U.S. Cl. 318—39 **4 Claims**



1. In a numerical controller for controlling the movement of a part of the action of two stepping motors moving in response to pulses, a control circuit comprising:

(a) oscillator means providing pulses at a rate proportional to the rate of desired movement of the part;

(b) drive means controlled by pulses from said oscillator means to drive said stepping motors both simultaneously and individually at a rate proportional to the rate it receives pulses;

(c) means to determine when said stepping motors are to be driven simultaneously;

(d) means for blocking pulses to one of said stepper motors when it is determined that both will not be driven simultaneously; and

(e) means interposed between said oscillator means and said drive means to reduce the rate of control pulses to said stepping motors by a factor of approximately 1.4 when both of said stepping motors are being driven simultaneously as compared to when they are driven individually.

4,234,831
COMPOUND ROTARY AND/OR LINEAR MOTOR

Josef Kemmer, No. 3, Ingolstadter Strasse, 8041 Haimhausen, and Eckhard Kellner, No. 14, Obere Dorfstrasse, 8061 Viehbach, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 684,124, May 7, 1976, abandoned. This application Jul. 18, 1978, Ser. No. 925,678
Int. Cl.³ H02K 7/06
U.S. Cl. 318—115 **5 Claims**

1. A compound rotary and linear motor comprising

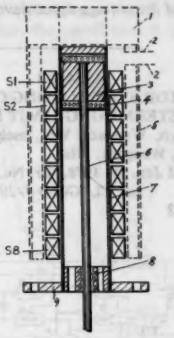
(a) a first stationary magnet system comprising consecutive stator sections arranged along a predetermined axis, each stator section including a plurality of electrically separate consecutive magnets arranged in a ring, the magnetic poles of consecutive stator sections lying side by side in axial alignment;

(b) a second magnet system comprising a rotor including at least one pair of magnet poles;

(c) said first and second magnet systems being interposed;

(d) means mounting said rotor for rotary movement about said axis and for linear movement along said axis; and

(e) an electronic control system responsive to control signals and adapted to sequentially energize said consecutive magnets of each stator section to rotate said rotor and to independently sequentially energize axially consecutive magnets to move said rotor axially;

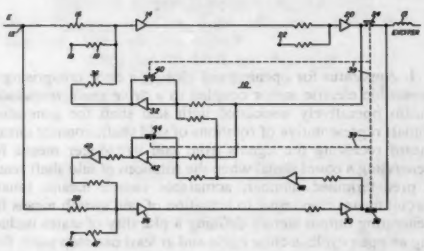


(f) whereby said motor may independently generate rotary, linear and helical motions.

4,234,832
ON-LINE SWITCHING BETWEEN TWO CONTROL PARAMETERS

Louis H. Dreinhoefer, Murrysville, Pa.; David W. Nolen, Evansville, Ind., and Paul C. Donatelli, Trafford, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 2, 1979, Ser. No. 53,846
Int. Cl.³ H02P 5/24
U.S. Cl. 318—146 **1 Claim**



1. A circuit arrangement adapted to provide smooth transition between voltage and speed control of the motor of a motor-generator set, comprising

a first circuit means for comparing a voltage reference signal and a signal representative of the speed of the motor of the set, and providing an output signal that is indicative of any difference existing between the levels of the voltage reference and speed signals,

a second circuit means connected to receive the output signal from the first circuit means and a signal representative of the current in the armature of the motor, and for producing a second output signal that is indicative of any difference existing between the first output signal and the current in the motor armature,

means for directing the output of the second circuit means to a voltage regulator of the generator to maintain excitation of the generator field at a value determined by the voltage and current references,

means for disconnecting the voltage regulator of the generator from the second circuit means,

a third circuit means for developing a voltage control signal for the generator field, and means for applying this signal to the generator field when the field is disconnected from the second circuit means, and

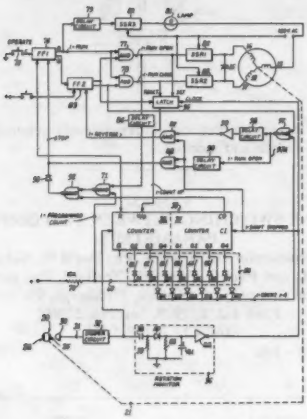
a fourth circuit means for comparing the voltage control signal developed by the third circuit means to the output of the second circuit means, and for causing said output of match that of the voltage signal developed for the voltage regulator.

4,234,833

DOOR OPERATOR SYSTEM USING COUNTER CIRCUIT FOR DETERMINING LIMIT POSITIONS

Jack E. J. Barrett, Waupaca, Wis., assignor to A. E. Moore Company, Inc., Waupaca, Wis.

Filed Jan. 19, 1978, Ser. No. 870,762
Int. Cl.³ G05D 3/20
U.S. Cl. 318—282 **12 Claims**



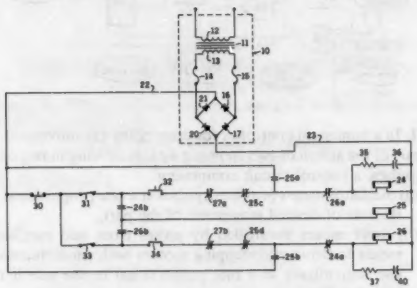
1. Apparatus for opening and closing a door comprising: a reversible electric motor coupled to a drive shaft; transducer means operatively associated with said shaft for generating signals representative of rotations of said shaft; counter circuit means receiving the signals from said transducer means for generating a count signal when the rotations of said shaft reach a predetermined number, actuatable switch means; binary circuit means responsive to actuation of said switch means for generating output signals defining a plurality of states including an open cycle, a close cycle and at least one stop state; first logic circuit means responsive to the output signals of said binary circuit means for selectively operating said motor in a first direction and a second direction when said binary circuit means is in said open and close cycles respectively to thereby drive said shaft to open and close said door, said first logic circuit means being further responsive to the output signals of said binary circuit means for de-energizing said motor when said binary circuit means is in said stop state; second logic circuit means for switching said binary circuit means from said open cycle to a stop state when said binary circuit means is in said open cycle and said counter circuit means generates said count signal to thereby de-energize said motor when said shaft has turned a predetermined number of revolutions; and rotation monitor circuit means responsive to the output signals of said transducer means for generating a signal when the rotation of said shaft stops; said second logic circuit means being responsive to the output signal of said rotation monitor circuit means and an output signal of said binary circuit means representative of the operation of said system in said close cycle to switch said binary circuit means to said open cycle and thereby reverse the direction of said motor when said shaft stops due to an obstruction during a close cycle, said second logic circuit means being further responsive to the output signal of said rotation monitor circuit means and an output signal of said binary circuit means representative of the operation of said system in an open cycle to change the state of said binary circuit means to cause said motor to stop; and detector means responsive to the output of said counter circuit means indicative of said door's being within a predetermined number of counts from a full closed position to modify the operation of said second logic circuit means during a close cycle to permit said binary circuit means to cause said motor to stop during said predetermined count rather than to reverse in direction if an obstruction is encountered as said door approaches the fully closed position.

4,234,834

D.C. MOTOR DIRECTIONAL CONTROL

G. B. Jennings, St. Louis, Mo., assignor to The Pandjiris Weldment Co., St. Louis, Mo.

Filed Jan. 10, 1979, Ser. No. 2,248
Int. Cl.³ H02P 1/22
U.S. Cl. 318—285 **6 Claims**



1. In a directional control for a D.C. motor including a motor armature circuit having an armature winding:

(a) a switching means operatively connected to the armature circuit for controlling the polarity of the direct current applied to the armature winding,

(b) a SCR in the armature circuit to control the current of the armature circuit,

(c) a control means operatively connecting the SCR to the switching means, the control means including a trigger means operatively connected to the SCR for providing a trigger signal to the SCR to turn on the SCR, and the control means operatively controlling the trigger means and the switching means for allowing the switching means to connect the armature winding in the armature circuit before a trigger signal is provided to the SCR,

(d) the switching means including forward and reverse relay means that are selectively activated, and

(e) the control means including a common relay means operatively connected to the forward and reverse relay means, and activated selectively by either the forward or reverse relay means for providing the trigger signal to the SCR after the forward or reverse relay means has been activated.

4,234,835

SPEED CONTROL APPARATUS FOR DC MOTOR

Mitsuharu Ota, Takatsuki; Isao Yoshida, Neyagawa, and Hiromitsu Nakano, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

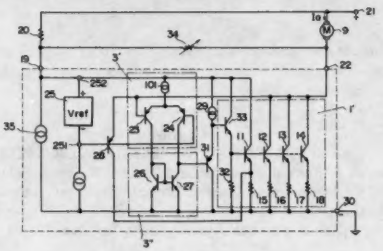
Filed Nov. 3, 1978, Ser. No. 957,577
Claims priority, application Japan, Nov. 14, 1977, 52-136893
Int. Cl.³ H02P 5/16
U.S. Cl. 318—317 **4 Claims**

1. A speed control apparatus for a DC motor comprising: a first transistor having a collector connected through a first resistor to a first end of a power source and having an

emitter connected through a second resistor to a second end of the power source,

at least one second transistor of the same conductivity type as said first transistor having a base connected to the base of said first transistor, having a collector connected through said DC motor to said first end of the power source and having an emitter connected through a third resistor to said second end of the power source,

a differential amplifier including a pair of transistors of the same conductivity type, said transistors having having emitters connected in common and joined through a constant current circuit to said collector of the first transistor, a first one of said pair of transistors having a base connected to the collector of said second and a second one of said pair of said transistors having a base connected



through a reference voltage source to the collector of said first transistor,

a current mirror circuit including an additional pair of transistors each having a collector, the collectors of said additional transistors being connected to respective collectors of the transistors of the differential amplifier at respective junction points,

a third transistor having a control electrode connected to one of said junction points and an output electrode connected to the bases of said first and second transistors to control their base currents in response to changes of collector current of one of the transistors of said differential amplifier, and

a speed adjusting variable resistor connected between the collector of said first transistor and the collector of said second transistor.

4,234,836

PHONOGRAPH TURNTABLE CONTROL SYSTEM

Harry Gaus, Kronberg; Jeffrey Johnson, Wiesbaden-Hessloch; Udo Milutziki, Walldorf, and Dietwald Schotte, Eschborn, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

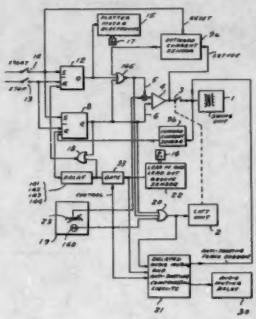
Continuation of Ser. No. 835,535, Sep. 22, 1977, Pat. No. 4,132,935. This application Sep. 27, 1978, Ser. No. 946,833

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642726

Int. Cl.³ H02P *5/06*

U.S. Cl. 318—480 **6 Claims**

1. An automatic turntable control system for operating an electrical arm lifter that raises and lowers a play arm upwardly and downwardly, for further operating an electric arm rotator that pivots the play are inwardly and outwardly about the fixed point, and for still further operating an electric motor to turn it on and off, whereby such operation can be coordinated in accordance with user instructions entered into the system by depression of electrical pushbutton switches and further in accordance with rotational position of the play arm, comprising: an arm sensor cooperating with the play arm generating an arm position signal which represents rotational position of the play arm; a user-activated pushbutton-type on-off switch for turning the turntable on and off and causing the arm lifter, the arm rotator and the motor to be appropriately operated after the on-off switch is activated; a user-activated pushbutton-type switch, the arm switch cooperating with the arm lifter to raise and lower the arm when the turntable is turned on in accordance with operation of the switch; and an electrical control network cooperating with the arm sensor, the arm lifter, the arm rotator, the motor, the on-off switch and the switch to



cause the play arm to be appropriately lifted, lowered and rotated and to further cause the motor to be turned on and off in order to cause a record to be played automatically and in order to further cause the play arm to be raised and lowered during record play by activation of the cue switch.

4,234,837

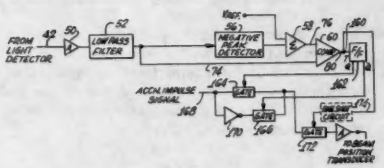
DIGITAL CENTER TRACKING SYSTEM

John S. Winslow, Altadena, Calif., assignor to MCA Discovision, Inc., Universal City, Calif.

Filed Jan. 12, 1979, Ser. No. 3,020

Int. Cl.³ G05B *19/33*

U.S. Cl. 318—577 **17 Claims**



1. A digital servo control system for controlling the position of a detection means with respect to an information track, said system comprising:

first transducer means for moving the detection means transversely with respect to the information track;

second transducer means for deriving an information signal from the detection means;

means for filtering the information signal to obtain an error signal indicative of the position of the detection means with respect to the track centerline;

signal processing means, for processing the error signal to obtain a timing signal indicative of transitions of the detection means through non-central parallel switching lines located at preselected distances from the track centerline; and

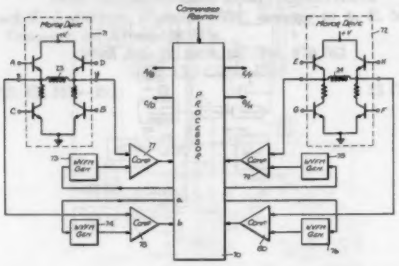
control means, responsive to the timing signal, for controlling the polarity and duration of an acceleration signal applied to said first transducer means to accelerate the detection means toward a corrected position, whereby the detection means is accelerated in alternating directions and oscillates about the track centerline.

4,234,838

INCREMENTAL MOTION MOTOR CONTROLLER

Lawrence W. Langley, and H. Keith Kidd, both of Christiansburg, Va., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jan. 11, 1979, Ser. No. 2,797
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **37 Claims**



1. An incremental motion motor controller for a linear, variable reluctance stepper motor comprising:

a first cylindrical motor member having a plurality of regular helical teeth with grooves therebetween, said teeth having a pitch P and a width equal to P/2;

a second cylindrical motor member surrounding at least a portion of said first member, said second member comprising two annular poles separated by an annular magnet, each pole having two annular elements separated by an annular winding, each element having a set of regular helical teeth with grooves therebetween, said teeth having a pitch P and a width equal to P/4, the sets of teeth in each pole being offset longitudinally from each other by an amount equal to $(n\pm\frac{1}{4})P$, n being an integer, said poles being offset from each other in the longitudinal direction by an amount equal to $(m\pm\frac{1}{4})P$, m being an integer, said windings characterized by no-motion signals having unperturbed waveforms and by motion-dependent signals having perturbed waveforms;

waveform generator means synthesizing waveforms modeled after said no-motion signals;

comparator means for comparing said synthesized waveforms with said motion-dependent waveforms; and

means for controlling the energization of said windings in response to said comparison.

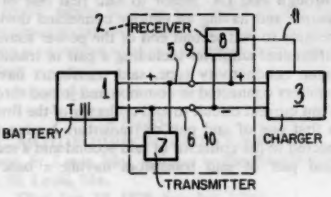
4,234,839

BATTERY CHARGING

Christopher D. King, 12 Parkers Rd., Parkdale, Victoria, and Noel T. Bowman, 11 Mountain Hwy., Frankston, Victoria, both of Australia, assignors to Christopher Duff King; Sally King, both of Parkdale and Noel Trevor Bowman, Frankston, all of, Australia

Filed Nov. 1, 1978, Ser. No. 956,823
Claims priority, application Australia, Nov. 8, 1977, 2344/77
Int. Cl.³ H02J *7/04*; H01M *10/46*
U.S. Cl. 320—36 **5 Claims**

1. A battery charging system comprising a charging circuit, battery temperature sensing means and charging circuit control means operatively connected with the battery temperature sensing means to stop charging when the temperature sensing means senses that the temperature of a battery being charged is at or above a predetermined temperature unsuitable for charging, and wherein the charging circuit control means includes a signal transmitter and a signal receiver and wherein the transmitter generates and transmits a signal when the temperature of the temperature sensing means is above a predetermined value and the receiver detects such signal and switches off the charging circuit and wherein during charging the signal transmitter and the signal receiver are continuously powered by DC which is on charging leads connected between said charging circuit and said battery, said signal transmitter being connected to the battery terminals and said temperature sensing means being connected to the battery so that when the charging leads are removed the signal transmitter and the temperature sensing means remain connected to the battery terminals as a unitary structure.

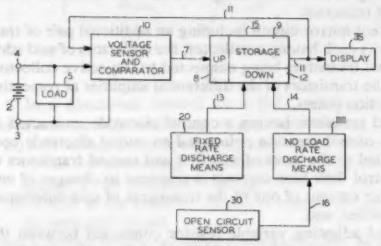


4,234,840

BATTERY STATE-OF-CHARGE INDICATOR

Charles E. Konrad, Roanoke, and Richard K. Davis, Salem, both of Va., assignors to General Electric Company, Salem, Va.

Continuation of Ser. No. 862,796, Dec. 21, 1977, abandoned.
This application Apr. 13, 1979, Ser. No. 29,941
Int. Cl.³ H02J *7/00*; G08B *21/00*
U.S. Cl. 320—48 **16 Claims**



1. A circuit for monitoring the charge state of a battery supplying discharge current to its normal load circuit under actual load operation during which battery discharge current is subject to magnitude variations and interruptions comprising:

(a) battery terminal voltage sensing means adapted to provide a scaled battery voltage signal representative of actual battery terminal voltage;

(b) storage means for storing a stored signal whose value is indicative of the state-of-charge of said battery, said stored signal having predetermined first and second values representative of battery terminal voltage under no-load conditions, said first and said second values being representative, respectively, of the fully charged and discharged battery;

(c) means for coupling said sensing means and storage means solely to increase the value of said stored signal at a rapid first rate to the scaled value of said battery voltage signal during intervals when the scaled value of said battery voltage signal exceeds the value of said stored signal;

(d) means for continuously decreasing the value of said stored signal at a slow second rate, said second rate being pre-established to provide for variation of said stored signal from said first value to said second value in a time period approximating the average time required for the fully charged battery to become discharged during normal operation of the load circuit; and

(e) means responsive to the value of said stored signal for

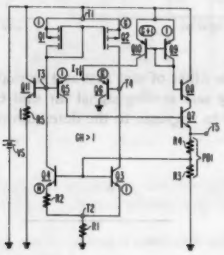
providing an indication of battery state-of-charge, whereby said circuit is operative under conditions of variable battery discharge current and without sensing the magnitude of battery discharge current.

4,234,841

SELF-BALANCING BRIDGE NETWORK

Otto H. Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 5, 1979, Ser. No. 9,350
Int. Cl.³ G05F 3/08
U.S. Cl. 323—1 **24 Claims**



1. A current amplifier comprising:

input, output and common terminals;

first and second bipolar transistors of a first conductivity type, having respective collector electrodes respectively connected to said input terminal and to said output terminal, having respective emitter electrodes connected to said common terminal, and having respective base electrodes with an interconnection therebetween through which the combined base currents of said first and second transistors flow;

third and fourth transistors of a second conductivity type complementary to said first conductivity type, having respective input electrodes respectively connected to said input terminal and to said output terminal, having respective output electrodes respectively connected to said common terminal and direct coupled to said interconnection between the base electrodes of said first and second transistors, and having respective common electrodes; and

means for completing the connection of said third and fourth transistors in long-tailed-pair configuration including

means responsive to the combined base currents of said first and second transistors for applying a tail current to an interconnection between the common electrodes of said third and fourth transistors which is in such proportion to those combined base currents as to maintain the potential offset between said input and output terminals substantially zero.

4,234,842

VOLTAGE REGULATOR AND FLICKER COMPENSATOR

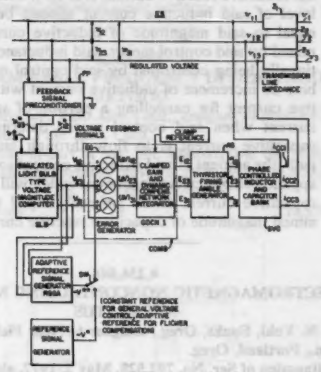
Michael B. Brennen, Wilkins Township, Allegheny County, and Laszlo Gyugyi, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 3, 1978, Ser. No. 892,556
Int. Cl.³ H02J 3/18
U.S. Cl. 323—119 **9 Claims**

1. A voltage regulator for an electrical system, comprising:

determining means interconnected with said electrical system for detecting the voltage in said electrical system and for providing a determining means output signal which is related to the variation in said voltage;

error detector means interconnected with said determining means for comparing the variation in said voltage with a fixed reference signal in a predetermined frequency range to thus provide an output error signal which is proportional to the difference between the reference signal and the variation in said voltage, said reference signal however varying in substantially exact correspondence with said variation in the voltage of said electrical system in a second frequency range which is lower than said predetermined frequency range and thus provide a zero output signal for voltage variation in said second frequency range; and



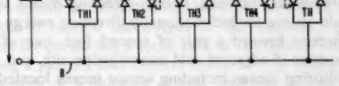
compensating means interconnected with said electrical system and said error detector means for providing regulation for said electrical system in correspondence with said error signal.

4,234,843

STATIC VAR GENERATOR WITH DISCRETE CAPACITIVE CURRENT LEVELS

Laszlo Gyugyi, Pittsburgh, and Peter Wood, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 15, 1978, Ser. No. 942,837
Int. Cl.³ H02J 3/18
U.S. Cl. 323—119 **9 Claims**



1. A VAR generator of the type which produces a controlled condution path for reactive current between two conductors in an electrical system, comprising:

(a) control means for determining whether said reactive current should be capacitive or inductive and for determining the magnitude thereof;

(b) discretely variable capacitance means disposed as part of said conduction path and interconnected with said control means for providing one of any number of fixed available discrete levels of capacitive current through said conduction path when said control means determines net capacitive reactive current is to flow therethrough, the discrete level of capacitive current so applied being the next closest largest available capacitive current to said magnitude

of capacitive current as determined by said control means; and

(c) continuously variable inductance means disposed as part of said conduction path and interconnected with said control means for providing any level of inductive current in a predetermined range of inductive current through said conduction path when said control means determines net inductive reactive current is to flow therethrough, the level of said inductive current applied being generally equal to said magnitude of inductive current as determined by said control means, said inductance means additionally being controlled by said control means to combine an increment of inductive current with said capacitive current for cancelling a portion of said capacitive current when said control means determines that net capacitive current is to flow through said conduction path, the amount of said inductive current so ordered to be applied being equal to an amount which will cause said net capacitive current to be generally equal to said determined magnitude of capacitive reactive current.

4,234,844

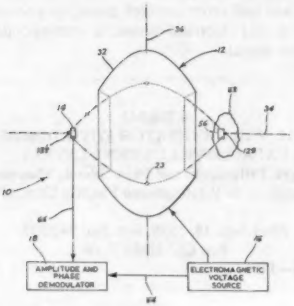
ELECTROMAGNETIC NONCONTACTING MEASURING APPARATUS

Tex N. Yukl, Banks, Oreg., assignor to Near Field Technology Co., Portland, Oreg.

Continuation of Ser. No. 792,528, May 2, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 969,985

Int. Cl.³ G01R *27/04*

U.S. Cl. 324—58.5 A **8 Claims**



1. Noncontacting apparatus for following an electrical characteristic of a substance located at a selected interrogation site, said apparatus comprising

a source for producing electromagnetic energy,

bidirectional, focusing, energy-directing means coupled to said source for bidirectionally directing energy produced thereby toward a pair of spaced foci, one of which is positioned adjacent said interrogation site, and

monitoring means including sensor means located adjacent the other one of said foci for monitoring changes in electrical conditions occurring adjacent said other one of said foci.

4,234,845

AUTOMATIC CONTROL OF ARMING SIGNAL FOR TIME INTERVAL MEASUREMENTS

Mark S. Allen, Saratoga, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 13, 1978, Ser. No. 959,969

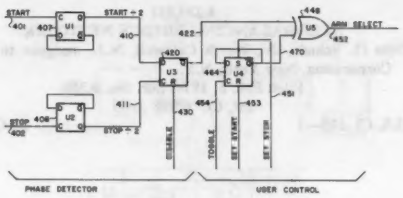
Int. Cl.³ G01R *25/00*

U.S. Cl. 324—83 D **2 Claims**

1. A method for use in the measurement of time intervals between first and second signals, said method comprising:

selecting one of said first and second signals for use in providing an arming signal for said time interval measurement;

detecting preselected changes of said first signal with respect to said second signal; and



selecting the other of said first and second signals for use in providing said arming signal for said time interval measurement in response to the detection of said preselected changes.

4,234,846

METHODS OF ELIMINATING CONVERSION FACTOR DRIFT EFFECTS IN A CLIP-ON HALL-EFFECT AMMETER

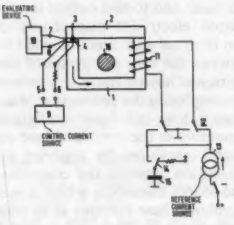
Albert Maringer, Karlsruhe, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 27, 1978, Ser. No. 928,688

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2735054

Int. Cl.³ G01R *33/00*

U.S. Cl. 324—117 H **4 Claims**



1. A method of operating a clip-on ammeter which includes a magnetic frame in the form of a clamp for enclosing a conductor in which current is to be measured, an air gap in the frame in which a Hall element is disposed for developing a Hall voltage and a winding of w turns on said frame, comprising:

(a) enclosing a conductor with said frame;

(b) measuring the Hall voltage U_{H1} of the Hall element;

(c) coupling a reference current source establishing a current I_{ref} in said winding to said winding in a direction such as to weaken the magnetic induction caused by the current in said conductor;

(d) measuring the Hall voltage U_{H2} with said reference current source coupled across said winding;

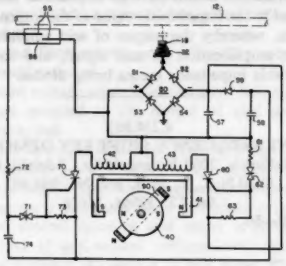
(e) forming the difference of the two measurements; and

(f) calculating a conversion factor K from said difference, said Hall voltage measurements said number of windings and said current I_{ref} using the equation $K=(U_{H1}-U_{H2})/(I_{ref}w)$.

4,234,847
FAULT INDICATOR

Edmund O. Schweitzer, 1002 Dundee Rd., Northbrook, Ill. 60118

Filed Nov. 6, 1978, Ser. No. 958,103
Int. Cl.[2] G01R *1/20*
U.S. Cl. 324—146 15 Claims

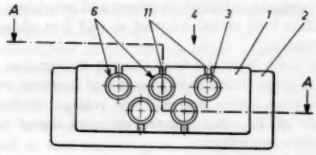


1. A fault indicator for indicating the occurrence of a fault current in an electrical conductor, comprising, in combination:
a housing;
status indicating means having a reset-indicating state and a fault-indicating state;
first circuit means for conditioning said status indicating means to said reset state, said first circuit means being periodically operable from an external excitation source;
second circuit means for conditioning said status indicating means to said fault-indicating state in response to an applied control affect;
fault detecting means responsive to occurence of a fault current in the conductor; and
time delay means responsive to detection of a fault by said fault detecting means for actuating said second circuit means after a predetermined delay period following the fault to preclude simultaneous actuation of said first and second circuit means.

4,234,848
TEST HEAD FOR INDUCTIVE SURFACE TESTING HAVING PLURAL RESONANT COILS HELD IN CONDUCTIVE HOLDER

Rudolf Diem, Dittelbrunn, and Hans-Jürgen Hentrich, Schweinfurt, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 908,929
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725354
Int. Cl.[3] G01R *33/00*
U.S. Cl. 324—262 7 Claims

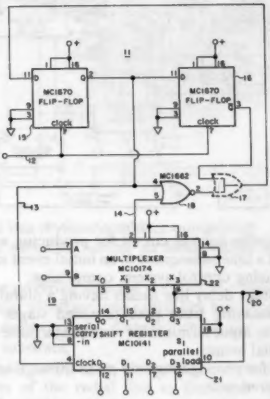


1. A test head for the inductive surface testing of metallic workpieces brought into proximity with said test head for areal scanning of the surface of such workpieces, comprising a holder of an electrically conductive material, a plurality of parallel spaced holes extending through said holder, a plurality of resonant circuits each including a coil having a ferrite core and each of said plurality of resonant circuits being mounted in each of said holes and coaxially therewith so that the axes of said coils extend at right angles to the workpiece surface, whereby the resonant frequencies are increased, thereby increasing sensitivity of said testing, the distance between adjacent said holes in said holder being less than the diameter of each said ferrite core so that the magnetic field built up under the test head loses little in intensity between adjacent holes, thereby maximizing accuracy in indicating longitudinal and transverse flaws of the workpiece surface.

4,234,849
PROGRAMMABLE FREQUENCY DIVIDER AND METHOD

William J. Crilly, Jr., Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 708,467, Jul. 26, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,126
Int. Cl.[3] H03K *21/36*
U.S. Cl. 328—46 11 Claims



1. An apparatus for dividing the frequency of an applied signal by a programmable integer divisor comprising:
frequency divider means having an input connected to receive an applied signal having a frequency to be divided, having a control input for selecting one of a plurality of partial divisors wherein the sum of positive integer multiples of said partial divisors is equal to a desired programmed divisor, and having an output for generating a signal with a partially divided frequency of the applied signal frequency;
shift register means having a plurality of interconnected cells each capable of storing data, having a clock input connected to receive the output of the frequency divider means for producing a serial shift of the data in said cells, having a parallel load control input, having a data output from each of a plurality of said cells and having a data input to each of a plurality of said cells for loading programming signals applied thereto into said cells;
first means for connecting one of said data outputs, which generates the desired frequency divided signal, to said parallel load control input for loading said cells with a programming signal applied to said data inputs, in response to signal appearing on the clock input of said shift register means;
second means for connecting one of said data outputs to the control input of said frequency divider means; and
said shift register means serially shifting said loaded data within said cells in response to the appearance of signals on the clock input of said shift register means to produce a change in the data in the cell having an output connected to the parallel load control input for causing a parallel

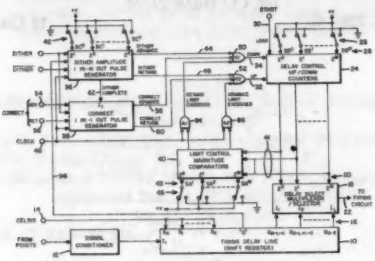
load only after an integer number of serial shifts, where said integer number is equal to the sum of said integers which are multipliers of the partial divisors, and for serially shifting said loaded data to produce a change in the data in the cell having an output connected to the control input of said frequency divider means, where said change is capable of controlling the selection of said partial divisors a number of times equal to the integer multiplier of the selected partial divisor.

4,234,850

FIRING TIME CONTROL CIRCUIT

Thomas W. Collins, State College, Pa., assignor to Optimizer Control Corporation, Burnsville, Minn.

Filed Jan. 8, 1979, Ser. No. 1,869
Int. Cl.[3] H03K *5/22, 3/04*
U.S. Cl. 328—66 **7 Claims**



1. An adaptive control circuit for producing an output circuit signal at a time subsequent to an initial event as determined by an optimizing control system, comprising:

(a) multi-stage delay line means having a plurality of output taps emanating from predetermined stages thereof and having an input terminal for receiving a pulse indicative of said initial event;

(b) means for propagating said pulse through said delay line at a desired rate;

(c) code responsive means coupled to said plurality of output taps for selecting only one of said taps at a time and delivering the signal thereon to a utilization device;

(d) bi-directional counting means having its output coupled to said code responsive means; and

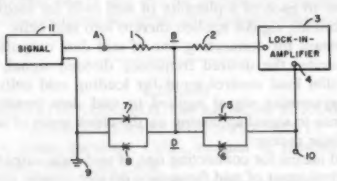
(e) means for incrementing or decrementing said counting means by a predetermined count value as determined by said optimizing control system.

4,234,851

LOGARITHMIC LOCK-IN AMPLIFIER

Richard L. Hartman, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 21, 1978, Ser. No. 972,179
Int. Cl.[3] H03F *3/10;* **G06G** *7/12*
U.S. Cl. 328—145 **1 Claim**



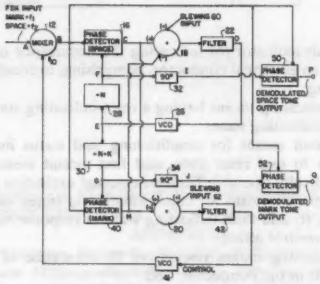
1. An amplifying system comprising a signal having an output connected between a first terminal and ground; a locked-in amplifier having an input and an output; first and second impedance means connecting said first terminal in a series circuit to said input of said amplifier; a first junction between said first and second impedance means; first and second variable impedance means connecting said output of said amplifier in a series circuit to said ground connection; a second junction between said variable impedance means; connecting means connecting said first and second junctions directly to each other; said variable impedance means have an impedance that is directly proportional to the logarithmic value of the impressed voltage across them, whereby the output of said amplifier will be a logarithmic amplification of said signal; and said first and second variable impedance means being diodes.

4,234,852

COHERENT FREQUENCY SHIFT KEY DEMODULATOR

John W. McCorkle, 2009 Evansdale Dr., Adelphi, Md. 20783

Filed Nov. 15, 1978, Ser. No. 960,992
Int. Cl.[3] H04L *27/14*
U.S. Cl. 329—50 **10 Claims**



1. A frequency shift key detector for demodulating mark and space tone frequency shifts from a carrier frequency comprising:

first phase locked loop means for locking onto and tracking the difference in frequency between said mark and space tones, said first phase locked loop means including:

a first space tone sub-loop comprising:

first phase detector means for receiving space tones and comparing them with a space tone loop signal;

a first summer having multiple inputs, one positive input of which is coupled to the output of said first phase detector;

first filter means coupled to the output of said first summer;

a first voltage controlled oscillator having its control input coupled to the output of said first filter means; and

first divider means coupled to the output of said first voltage controlled oscillator and providing said space tone loop signal coupled to said first phase detector means;

a first mark tone sub-loop sharing in common with said first space tone sub-loop said first summer means, said first filter means, and said first voltage controlled oscillator and in addition to said elements shared in common further including:

second divider means coupled to the output of said first voltage controlled oscillator for generating a mark tone loop signal; and

second phase detector means for receiving mark tones and comparing them with said mark tone loop signal, wherein the output of said second phase detector means is coupled to a negative input of said first summer;

second phase locked loop means for locking onto and track-

ing the overall frequency drift of said mark and space tones, said second phase locked loop means including:

a second space tone sub-loop sharing said first phase detector means with said first space tone sub-loop and further comprising:

a second summer having multiple inputs, wherein one positive input is coupled to the output of said first phase detector means and another positive input is coupled to the output of said second phase detector means;

a second filter means coupled to the output of said second summer;

a second voltage controlled oscillator having its control input coupled to the output of said second filter means; and

a mixer having a first input for receiving said carrier, mark and space frequencies and a second input for receiving an input mix signal and an output providing frequency translated mark and space tones, wherein said second input of said mixer is coupled to the output of said second voltage controlled oscillator and wherein the output of said mixer is coupled to said first phase detector for supplying said mark and space tones thereto;

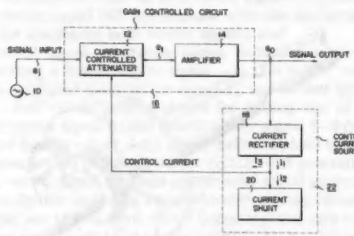
a second mark tone sub-loop, sharing in common with said second space tone sub-loop said mixer, said second summer, said second filter means, and said second voltage controlled oscillator and sharing in common with said first mark tone sub-loop said second phase detector means wherein said second phase detector means is coupled to the output of said mixer.

4,234,853

AUTOMATIC LEVEL CONTROL CIRCUIT

Hiroyasu Yamaguchi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 11, 1978, Ser. No. 923,629
Claims priority, application Japan, Jul. 15, 1977, 52/94354
Int. Cl.[2] H03G *3/30*
U.S. Cl. 330—280 **25 Claims**



1. An automatic level control circuit for controlling the level of an input signal comprising:

a gain controlled circuit having input, output and control ports, said input port for coupling to said input signal to be level controlled and said output port supplying a level controlled output signal, the gain of said gain controlled circuit being controllable responsive to a control current applied to said control port, said gain controlled circuit including at least one variable impedance element, the impedance of which is a function of said control current; and

a control current source for supplying said control current, said control current being a function of the difference between a direct current component corresponding to the level of said input signal and a reference current;

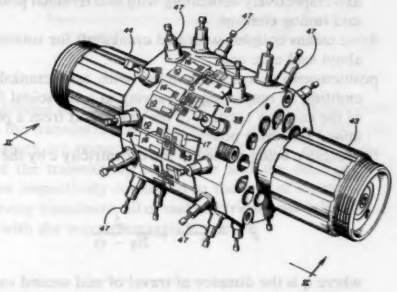
wherein the output impedance of said control current source is high so that said control current is substantially independent from the temperature change of the voltage drop occurring across said variable impedance element.

4,234,854

AMPLIFIER WITH RADIAL LINE DIVIDER/COMBINER

James M. Schellenberg, Severna Park, and Marvin Cohn, Baltimore, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 12, 1978, Ser. No. 905,604
Int. Cl.[3] H03F *3/60*
U.S. Cl. 330—286 **11 Claims**



1. A radial line divider/combiner comprising:

an annular substrate having an inner radius and an outer radius;

a radial line covering selected portions of a major surface of the annular substrate, said radial line having a plurality of sectors symmetrically disposed about the center of the annular substrate;

a plurality of transmission lines radially extending from the perimeter of the radial line to the outer radius of the substrate; and

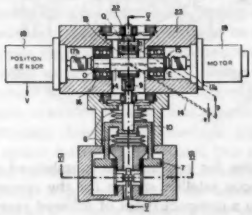
a plurality of isolation resistors connecting laterally adjacent sectors of the radial line.

4,234,855

SYSTEM FOR LINEARLY TUNING A MICROWAVE OSCILLATOR

Guido Busacca; Pietro Luparello; Lucio Marranca, and Michele Sanfilippo, all of Palermo, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jan. 31, 1979, Ser. No. 8,091
Claims priority, application Italy, Feb. 2, 1978, 19895 A/78
Int. Cl.[3] H01P *7/04*; H03B *9/10, 23/00*
U.S. Cl. 331—90 **6 Claims**



1. In a generator of microwaves of variable frequency provided with a resonant cavity and a tuning element in said cavity, said tuning element being linearly displaceable between

two terminal positions corresponding to respective limiting frequencies f_1 and f_2,

the combination therewith of:

a rotatable crankshaft;

a mechanical linkage coupling said crankshaft with said tuning element, said linkage including a pitman with a first extremity fulcrumed on said crankshaft and a second extremity positively connected with said tuning element via a pivotal joint, said crankshaft having an eccentricity e, said pitman having an effective length p measured between the pivotal axes of said extremities, said second extremity being substantially linearly guided between a first dead-center position farther from the axis of said crankshaft and a second dead-center position closer to said axis respectively coinciding with said terminal positions of said tuning element;

drive means coupled with said crankshaft for rotating same about said axis; and

position-sensing means coupled with said crankshaft for emitting an output signal varying as a sinusoidal function of the angle of rotation of the crankshaft from a predetermined reference position;

the length p being related to the eccentricity e by the expression

$$p = \frac{q - e}{2} + \frac{e^2}{2(q - e)}$$

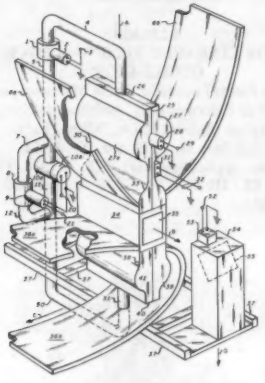
where q is the distance of travel of said second extremity between said first dead-center position and an intermediate position thereof in which said frequency has a mean value of $(f_1+f_2)/2$ whereby said frequency varies as a sinusoidal function of said angle of rotation and is proportional to said output signal.

4,234,856

GASDYNAMIC SOLAR POWERED LASER

Check K. Jung, Brooklyn, and Harold E. Whalen, Dix Hills, both of N.Y., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 17, 1977, Ser. No. 825,352
Int. Cl.[2] H01S *3/045, 3/091, 3/223*
U.S. Cl. 331—94.5 P **11 Claims**



1. Apparatus for operation at a stabilized extraterrestrial geosynchronous satellite station for the conversion of solar radiation into a compact beam of infrared energy directed to perform work at a predetermined second station, comprising:

gas laser means including:

solar energy absorber means,

transverse flow gas laser means, and

thermal radiator means for radiation of degraded thermal energy,

said transverse flow gas laser means being characterized by producing a compact beam of infrared radiation, when said solar energy absorber means is excited by solar energy, along a first path,

solar radiation collector means normally oriented for maximum coupling of solar energy into said solar energy absorber means along a second path at a substantially right angle to said first path,

radiant energy directive means coupled to said thermal radiator means for coupling degraded energy into space generally in at least a part of a plane substantially perpendicular to said second path and spaced from said first path whereby said thermal radiator means is substantially shielded from solar radiation and from said infrared beam,

said solar energy absorber means, said transverse flow gas laser means, and said thermal radiator means forming closed envelope means of a common cavity for enclosure of a lasable gas, and

gas conduit means connecting said common cavity at said thermal radiator means to said common cavity at said solar energy absorber means for forming closed loop gas conduit means,

discharge valve means within said common cavity disposed between said solar energy absorber means and said transverse flow gas laser means, and

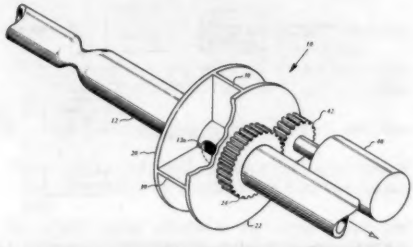
pump means in serial relation in said gas conduit means for raising the pressure of gas within said solar energy absorber means to a predetermined level in cooperation with said solar energy when said discharge valve means is closed.

4,234,857

CENTRIFUGAL GASDYNAMIC WINDOW

Frank J. Stoddard, Huntington Beach, Calif., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Apr. 13, 1979, Ser. No. 30,034
Int. Cl.[3] H01S *3/02*
U.S. Cl. 331—94.5 G **3 Claims**



1. In a flowing gas laser having a laser tube with radially extending ports for the passage of a laser beam, the improvement consisting of a centrifugal gasdynamic window assembly for establishing a fluid seal between a laser medium in the laser tube and ambient atmosphere while permitting passage of the laser beam through the radially extending ports and including:

two rotatable discs;

means for maintaining said discs in a spaced relationship and on respective sides of said ports;

means for causing said discs to rotate as a unit at a predetermined speed about the laser tube whereby a radially extending pressure gradient is established between said discs which prevents flow between the laser medium and atmosphere while permitting passage of the laser beam between said discs.

4,234,858
VOLTAGE CONTROLLED OSCILLATOR WITH PHASE CONTROL CIRCUITS

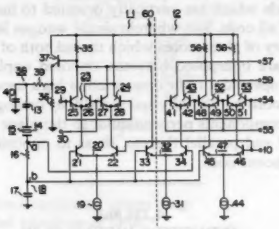
Hiroshi Gomi, Fukaya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Division of Ser. No. 773,689, Mar. 2, 1977, Pat. No. 4,128,817. This application Jul. 11, 1978, Ser. No. 923,643

Claims priority, application Japan, Mar. 3, 1976, 51-22270; Mar. 9, 1976, 51-24646; Mar. 9, 1976, 51-24647; Mar. 10, 1976, 51-24998

Int. Cl.³ H03B 5/36; H04N 9/535

U.S. Cl. 331—177 R **7 Claims**



1. A voltage controlled oscillator comprising:

a resonant circuit;

means for phase-shifting by a predetermined amount a first reference vector signal ($\dot{e}_1$) from one end of said resonant circuit, thereby generating a second reference vector signal ($\dot{e}_2$);

means for generating a third vector signal ($\dot{e}_3$) equal to the difference between said first and said second reference vector signals ($\dot{e}_1$, $\dot{e}_2$);

means for generating a vector signal $\dot{e}_4$ and for feeding back said vector signal and said third vector signal e_3 to said resonant circuit, including means for generating a vector signal 180° out of phase with said vector signal $\dot{e}_4$ and including a first control-addition means for receiving one of said first, second and third vector signals, for controlling the absolute value of said vector signal $\dot{e}_4$ relative to said vector signal 180° out of phase with said vector signal and for combining both vector signals; and

hue control signal generating means including means for generating a fourth vector signal $-\dot{e}_3$ that is 180° out of phase with said third vector signal $\dot{e}_3$, and further including a first vector adding circuit for adding one of said third vector signal e_3 and fourth vector signal ($-\dot{e}_3$) to a vector signal ($-\dot{e}_2$ or $+\dot{e}_2$) which differs in phase by $+90°$ from said third or fourth vector signals, and generating a fifth vector signal (e_6) said hue control signal generating means further including a second vector adding circuit for adding one of said third vector signal (e_3) and said fourth vector signal ($-\dot{e}_3$) to a vector signal ($-\dot{e}_2$ or $+\dot{e}_2$) which differs in phase by $-90°$ from said third or fourth vector signal, thereby generating a sixth vector signal ($\dot{e}_5$).

4,234,859
ELASTIC SURFACE WAVE DEVICE AND METHOD FOR MAKING THE SAME

Hiroshi Ikushima, Hirakata; Toyota Noguchi, Kyoto; Tsuneo Danno, Moriguchi, and Tooru Tamura, Ikeda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

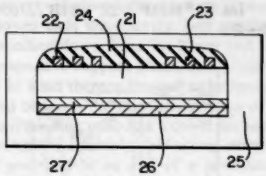
Filed Feb. 14, 1979, Ser. No. 12,193

Claims priority, application Japan, Feb. 14, 1978, 53-16176

Int. Cl.³ H03H 9/25, 9/42, 3/08, 9/10

U.S. Cl. 333—151 **2 Claims**

1. An elastic surface wave device comprising a resin having embedded therein a unitary body comprising: a piezoelectric plate; a transmitting interdigital transducer and a receiving interdigital transducer, both transducers being attached to one major surface of the piezoelectric plate, which unitary body is attached to a unitary supporting substrate via double adhesive layers, one of which is composed of one kind of adhesive resin and the other of which is composed of another kind of resin, different from the former in ultrasonic property, each of the transducers comprising a pair of electrodes facing each other, a wave propagation surface for an elastic surface wave being



thereby defined on the major surface of the piezoelectric plate between the transducers; and two pairs of electrical leads, one pair of which are respectively connected to the pair of electrodes of the transmitting transducer and the other pair of which are respectively connected to the pair of electrodes of the receiving transducer, all of said electrical leads being out of contact with the wave propagation surface.

4,234,860
PIEZOELECTRIC FILTER AND PROCESS FOR THE MANUFACTURE THEREOF

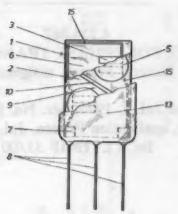
Heinz Schumacher, and Hermann Zacharias, both of Cologne, Fed. Rep. of Germany, assignors to Draloric Electronic GmbH, Nuremberg, Fed. Rep. of Germany

Filed Apr. 4, 1978, Ser. No. 893,333

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 2715202

Int. Cl.² H03H 9/04, 9/10, 9/14; H01L 41/22

U.S. Cl. 333—187 **18 Claims**



1. A piezoelectric filter, comprising:

a resonator including: a resonator body, having two opposite principal surfaces, at least one electrode on each of said surfaces, and a respective external connector for each of said electrodes, each of said external connectors being in electric contact with its respective electrode;

an ian insulating envelope encasing said resonator; said connectors extending through said envelope; and

a respective spacer between each of said two principal surfaces of said resonator body and said envelope; said spacers each comprising a preformed self-adhesive film and having a first set of regions which register with respective ones of said electrodes and which are maintained out of physical contact with said electrodes, and each of said spacers having a second set of regions that are in contact with said resonator body.

4,234,861

ELECTRICAL WINDINGS

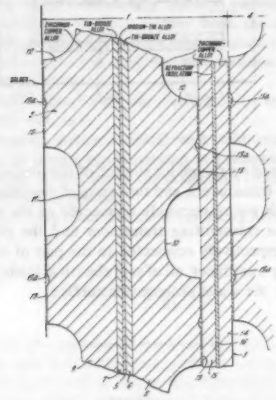
Alan Woolcock, Lichfield; Bryan W. H. Lowe, Sutton Coldfield, and Colin R. Walters, Abingdon, all of England, assignors to Imi Kynoch Limited, Birmingham, England

Filed Mar. 13, 1978, Ser. No. 886,128

Claims priority, application United Kingdom, Mar. 14, 1977, 10734/77

Int. Cl.³ H01F *7/22*; H01B *12/00*

U.S. Cl. 335—216 **13 Claims**



1. An electric winding comprising a plurality of turns of a strip conductor consisting of a layer of a material which can be rendered superconducting sandwiched between two metallic layers of equal thickness adapted to thermally stabilise the layer of material which can be rendered superconducting when it is in the superconducting state, and interposed between each turn of the strip conductor in the winding a composite strip comprising a layer of insulating material sandwiched between two layers of metal so as to occupy the neutral axis of the composite strip.

4,234,862

ROBUST POLYPHASE TRANSFORMER

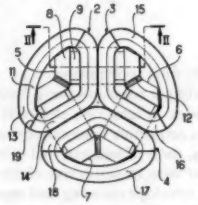
Gérard Prevotat, Nevers, France, assignor to Alsthom-Unelec, Paris, France

Filed Jul. 7, 1978, Ser. No. 922,699

Claims priority, application France, Jul. 22, 1977, 77 22536

Int. Cl.³ H01F *33/00*

U.S. Cl. 336—5 **1 Claim**



1. A polyphase transformer for oil immersion cooling within a tank and having a magnetic core for each phase, said cores being in contact with each other and oriented vertically and having two adjacent re-tangular sides each of which is disposed against one of the rectangular sides of an adjacent magnetic core, and each core threading a coil which comprises a high tension winding of trapezoidal right cross-section and a low tension winding of rectangular right cross-section, with said trapezoidal right cross-section high tension winding radially surrounding the low tension winding, each magnetic core being symmetrical about the plane of symmetry of two adjacent coils and being resin impregnated, the improvement wherein: said magnetic cores are sawn into two parts along a plane perpendicular to the plane of symmetry, said two parts being stuck together and being made from magnetic sheets of at least two different widths so as to provide a right cross-section including at least one step and said two adjacent sides forming a core cross-section of pseudo-elliptical shape such that the uppermost coil is horizontally disposed to form cooling channels which are vertically oriented to insure adequate cooling of all coils, and wherein single wedges lie in the plane of symmetry of given cores which thread both of two adjacent coils and are interposed between opposed coplanar sides of opposed trapezoidal right cross-section high tension windings to jam the coils both axially and radially by orthogonal tightening force components perpendicular to the plane of symmetry of the coil and parallel thereto, so as to oppositely mutually wedge adjacent coils.

4,234,863

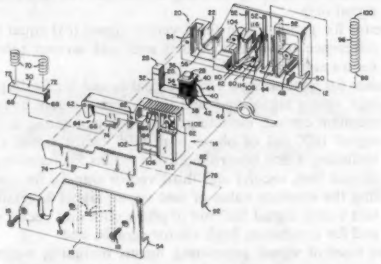
INDUCTIVE PICKUP CLIP

DeWayne J. Shumway, Fruita, and Delbert D. Gennetten, Grand Junction, both of Colo., assignors to Dixson, Inc., Grand Junction, Colo.

Filed Nov. 8, 1978, Ser. No. 958,748

Int. Cl.³ H01F *27/02, 40/06*

U.S. Cl. 336—90 **14 Claims**



1. An inductive pickup clip for generating an output signal in response to changes in the flow of electric current in an electric conductor about which said clip is adapted to be removably secured, wherein said clip is of the type including:

first and second body portions having first and second core portions secured thereto respectively, wherein said first body portion is held telescopically within said second body portion; and

a pickup coil means positioned about one of said core portions and having terminals adapted to be connected to an electrical circuit;

wherein said body portions, and hence said core portions, are telescopically selectively movable with respect to each other between an open configuration and a closed configuration in which said core portions fit together to define an opening adapted to receive said electric conductor during use, and

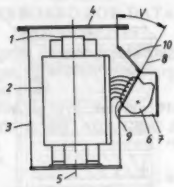
wherein the improvement comprises: shock absorbing means located only at the end portions of at least one of said core portions and being secured between said at least one of said core portions and its respective body portion for cushioning said at least one core portion as said core portions are moved into contact with each other in said closed configuration, to prevent chipping or breaking of said core portions and to insure a close fit and correct alignment between said core portions when in said closed configuration.

4,234,864

TRANSFORMER WITH OFFSET SIDE WALL-MOUNTED ON-LOAD TAP CHANGER

Birger Johansson, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed Jun. 11, 1979, Ser. No. 47,644
Claims priority, application Sweden, Jun. 16, 1978, 7806937
Int. Cl.³ H01F *27/04*
U.S. Cl. 336—90 4 Claims



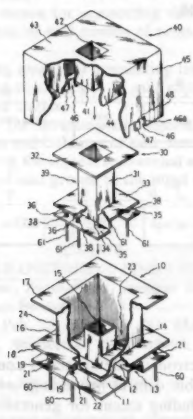
1. Transformer apparatus comprising:
a liquid-filled transformer tank;
a transformer core and windings mounted within said transformer tank, and at least one of said windings including tapping points;
a tap-changer tank mounted on the outside of one side wall of said transformer tank;
an on-load tap changer connected to said tapping points and mounted within said tap-changer tank;
said tap changer including a terminal board mounted at the dividing line between said transformer tank and said tap-changer tank; and
said tap-changer tank being mounted to said transformer tank such that said dividing line is directed obliquely outwardly and upwardly from the vertical plane in which the side wall of said transformer tank is substantially located.

4,234,865

TRANSFORMER FRAMING STRUCTURE

Katsumi Shigehara, 29-15, Higashikashiwagaya 2-chome, Eginashi,Kanagawa-ken, Japan

Filed Jul. 9, 1979, Ser. No. 56,094
Int. Cl.³ H01F *27/02, 27/30*
U.S. Cl. 336—92 4 Claims



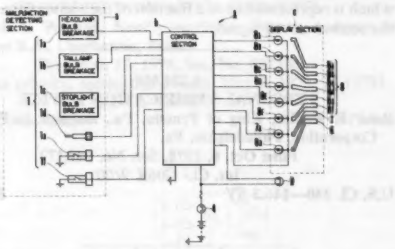
1. A transformer framing structure comprising a frame body including a base plate having provided centrally thereof a trapezoidal raised-up portion forming a channel extending through said base plate, and a prismatic portion provided at the center of said trapezoidal portion, with the hollow of said prismatic portion being in communication with said channel, said prismatic portion being enclosed by a wall erected on said base plate outside of and spaced-apart from said prismatic portion, said enclosing wall being provided with the upper and lower flanges at its both ends; a bobbin assembly comprising a prismatic portion provided with the upper and lower flanges at its upper and lower ends respectively, said prismatic portion having legs extending down from the lower end thereof and joined to the respective support plates, said bobbin assembly being designed to wind thereon the coil to be housed in a coil chamber defined between the prismatic portion of said frame body and the surrounding wall; and a cover for enclosing said frame body and bobbin assembly, said cover comprising a top cover portion provided at an end of a prismatic structure disposed in opposition to the prismatic portion of said frame body and a side cover portion extending down vertically from the outer periphery of said top cover portion.

4,234,866

CENTRALIZED ALARM SYSTEM FOR VEHICLES

Masahiko Kuroda, Chigasaki, and Eiji Ohsawa, Ebina, both of Japan, assignors to Nissan Shatai Co., Ltd., Japan

Filed Nov. 1, 1978, Ser. No. 956,788
Claims priority, application Japan, Dec. 26, 1977, 52-155635
Int. Cl.² G08B *19/00*
U.S. Cl. 340—52 F 42 Claims

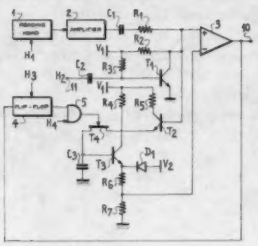


1. A centralized alarm system for vehicles, having sensors provided on various parts of the vehicle for detecting the conditions of said parts, comprising, a control section for controlling signals generated from said sensors, an indicating section for indicating the conditions of said parts according to signals generated from said control section, a main alarm device connected to said control section, local alarm devices corresponding to said parts to be inspected connected to said control section, a check switch, connected to said control section, and a circuit in said control section adapted to give said control section a command for indicating abnormal parts in response to a signal produced when said check switch is closed, said circuit including means so that when one or a plurality of said parts are detected to be abnormal, said main alarm device is first turned on and then the parts found to be abnormal are indicated by the closing of said check switch.

4,234,867
THRESHOLD DEVICE FOR DISTINGUISHING THE WHITE LEVEL FROM THE BLACK LEVEL IN AN INPUT SIGNAL DELIVERED BY A READING HEAD FOR ANALYZING A DOCUMENT

Henri Butin, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 10, 1979, Ser. No. 73,855
Claims priority, application France, Sep. 8, 1978, 78 25850
Int. Cl.³ G06K *9/38*; H03K *5/153*
U.S. Cl. 340—146.3 AG **4 Claims**



1. A threshold device for distinguishing the white level from the black level in a first signal delivered by the output of a reading head for analyzing a document, and comprising amplification means having one input coupled to the output of the reading head and one output for delivering a second signal, a comparator having a first input coupled to the output of the amplification means, a second input and an output for delivering a signal having a first level when the level of the first signal is a white level and a second level when the level of the first signal is a black level, storage means having one input coupled to the output of the amplification means for storing the value of the level of the second signal, a control input coupled to the output of the comparator for controlling the storage operation under the action of the first level and an output coupled to the second input of the comparator in order to deliver a signal which is representative of a fraction of the value of the level of the second stored signal.

4,234,868
PERSONAL VERIFICATION DEVICE

Peter F. Radice, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

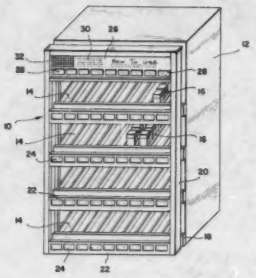
Filed Oct. 6, 1978, Ser. No. 949,172
Int. Cl.² G06K *9/00*
U.S. Cl. 340—146.3 SY **5 Claims**

1. In a verification device having a surface adapted to receive hand markings and to transmit a representation of said markings by electrical energy for comparison with a similar representation, the improvement wherein said surface comprises a poled sheet of a piezoelectric-forming resin, said poled sheet holding a sufficient charge to provide an electric response when said sheet is hand marked and being coated on each side with an electroconductive coating for transmission of electric responses generated by said hand markings.

4,234,869
MERCHANDISE DISPLAY AND CATEGORICAL INDICATORS

Robert M. Sandelman, 11 E. 36th Street, New York, N.Y. 10016

Filed Nov. 15, 1978, Ser. No. 960,771
Int. Cl.² G08B *5/00*
U.S. Cl. 340—286 R **8 Claims**

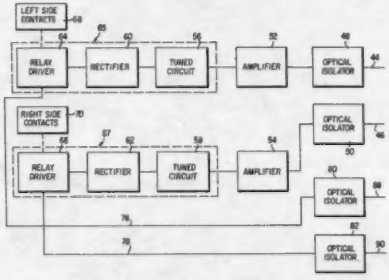


1. A categorical indicator device on an article display rack, said display rack including a plurality of rows for display of articles, said articles, discretely stackable on said shelves in columns, said shelves slanted downward for gravity feed of said articles, said categorical indicator device adapted to optionally indicate at least one subset of a category matrix of articles, said indicator device comprising indicator means including members having a one-to-one physical relationship with individual members of said category matrix at said columns, storage means for storing the identity of said at least one category subset, selection means for selecting a selected subset of said at least one subset, and control means for energizing selected indicator members associated with said selected subset whereby said selected subset is distinguished from other articles.

4,234,870
VITAL ELECTRONIC CODE GENERATOR

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Jan. 11, 1979, Ser. No. 2,765
Int. Cl.³ G08G *25/00*; G06F *11/30*; H04L *1/14*
U.S. Cl. 340—348 **15 Claims**



1. A vital electronic code generator comprising:
a programmable central processing unit, said central processing including means for generating a signal at a selected code rate, said signal including pulses formed by a carrier signal of a given frequency,
relay driving means for operating relay contacts, said relay driving means including circuit means tuned to said fre-

quency of said carrier signal for discriminating against signals of other frequencies,

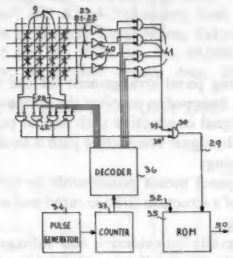
output channel means for coupling said relay driving means to said central processing unit; and,

feedback means coupled between said relay driving means and said central processing unit for comparing the activity of said relay driving means with the output of said central processing unit.

4,234,871
CAPACITIVE KEYBOARD FOR DATA PROCESSING EQUIPMENTS

Nicolo Guglielmi, Turin; Giandomenico Dagna, and Bruno Visentin, both of Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jun. 6, 1978, Ser. No. 913,217
Int. Cl.[3] G06F *3/023*; G08C *9/02*
U.S. Cl. 340—365 S **8 Claims**



1. A capacitive keyboard for data processing equipment comprising:

a plurality of keys,

a keyboard encoder,

a plurality of variable capacitors associated with said plurality of keys, said capacitors being arranged according to a matrix by a group of rows and a group of columns, each capacitor comprising a single-piece fixed armature, a single-piece movable armature adapted to be moved upon the depression of the associated key, and a polarized dielectric material interposed between said armatures, each capacitor upon the depression of the associated key generating on the corresponding armatures a pair of signals of opposite polarities,

first connecting means for connecting the fixed armatures according to one of said groups of rows and columns of said matrix,

second connecting means for connecting the movable armatures according to the other of said groups of rows and columns of said matrix,

inverting means for inverting the signals of one of said groups of rows and columns of said matrix, and

means for applying the signals so inverted and the signals of the other one of said groups to the input of said keyboard encoder.

4,234,872
CIRCUIT ARRANGEMENT FOR A KEYBOARD

Mathis Halder, Baar, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Feb. 23, 1979, Ser. No. 15,605
Claims priority, application Switzerland, Mar. 8, 1978, 2516/78
Int. Cl.[3] G06F *3/02*
U.S. Cl. 340—365 R **4 Claims**

1. A keyboard circuit arrangement comprising:

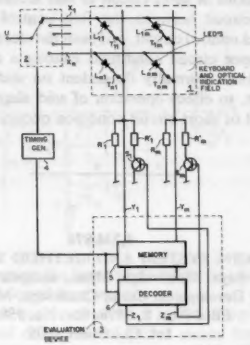
a plurality of light-emitting diodes arranged to provide an optical indication field;

a like plurality of switches, each of said switches connected in series with a different one of said diodes to form a matrix with rows and columns;

a multiplexer connected for selectively energizing successive rows of said matrix;

an evaluation device connected to the columns of said matrix, the current flow through a matrix column normally being insufficient to activate the diode in the matrix column;

the outputs of said evaluation device being connected to said matrix columns, said evaluation device,



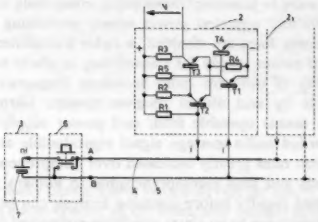
being capable of detecting when a switch has been actuated, and

being operable, subsequent to said switch actuation, to increase current flow through the matrix column corresponding to the actuated switch when the matrix row corresponding to the actuated diode is energized to thereby activate the diode associated with the actuated switch.

4,234,873
ALARM INSTALLATION WITH A NUMBER OF SELF POWERED INDICATING ELEMENTS

Bertrand A. Warnod, Neuilly-sur-Seine, France, assignor to Klaxon S.A., Courbevoie, France

Filed Apr. 17, 1978, Ser. No. 897,085
Claims priority, application France, May 4, 1977, 77 13793
Int. Cl.[3] G08B *29/00*
U.S. Cl. 340—509 **6 Claims**



1. In an alarm system comprising a plurality of indicating elements each including a warning device and an independent power supply source, the provision of

(a) a first control circuit for each respective element connected between the source and the warning device to control the operation thereof;

(b) coupling means comprising a pair of wires connected to the first control circuit of each indicating element to form a pair of common connections in parallel therebetween;

(c) a second control circuit between the pair of wires form-

ing said coupling means at a position remote from said first control circuits connected with each said first control circuit via said coupling means to form a common control for each said indicating element capable of maintaining a potential difference between the pair of wires of said coupling means, and

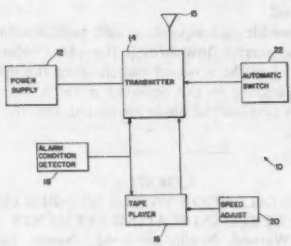
(d) a switch mechanism for actuating said alarm connected between said common second control circuit and each said first control circuit via said coupling means, said mechanism being operable to effect at least one of the conditions of short circuit of said second control circuit, open-circuit between the first control circuit and the second control circuit, and both the aforesaid short circuit and open circuit conditions causing a change in circuit conditions normally dependent on said second control circuit, to effect operation of said alarm when an open circuit or short circuit condition occurs.

4,234,874

ALARM SYSTEM AND METHOD THEREOF

Wayne P. Saya, Cambridge, Mass., assignor to Inventional/-Security Development Corp., Cambridge, Mass.

Filed Nov. 8, 1978, Ser. No. 958,822
Int. Cl.[2] G08B *1/08*
U.S. Cl. 340—539 **2 Claims**



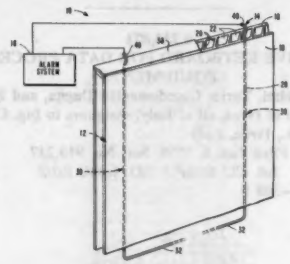
1. An alarm system responsive to an alarm condition detector to communicate a message to a distant radio receiver system operable to receive messages on a plurality of frequencies, featuring fail safe features that prevent disabling the system by cutting wires or jamming transmission, comprising in combination, a battery operated power supply permitting operation when power lines are disabled, a radio transmitter operable from said power supply for transmitting an alarm message on a plurality of different radio broadcast frequency channels receivable by said distant receiver system, alarm message repeater means operable from said power supply having a pre-recorded audio message signal reproducible at audio reproduction rates greatly increased over comprehensible audible speeds and thus incomprehensible to humans and to be transmitted rapidly before jamming analysis can be effective, means responsive to an alarm condition connected for activating said alarm message repeater to modulate said transmitter with said signal at said reproduction rates, and means activating said transmitter to broadcast the recorded signal on each of the different frequency channels including means operable from said power supply selecting a cyclic sequence of said plurality of different frequencies at a repetition rate of a few seconds timed so that the transmitter will repeat the message on each of the plurality of frequencies thereby permitting effective radio transmission of the alarm message to the distant receiver in the presence of jamming of any less than all said plurality of different broadcast frequency channels.

4,234,875

SECURITY STRUCTURE

William H. Williams, Palos Verdes Peninsula, Calif., assignor to Sandstone, Inc., La Mirada, Calif.

Filed Mar. 6, 1978, Ser. No. 883,487
Int. Cl.[2] G08B *13/12*; E05G *1/10*
U.S. Cl. 340—550 **35 Claims**



1. A securing panel arrangement for use with an intrusion alarm system designed to monitor the continuity of a normally continuous signal conductive path and to produce a warning signal when the signal conductive path is broken, said arrangement comprising:

a cellular panel means positionable to cover an area on a surface of a structure to be secured and attachable thereto, including:

two generally co-extensive and substantially continuous parallel outer walls spaced a relatively small distance apart, and

a series of elongated inner walls substantially parallel to each other joining said outer walls to form a series of parallel elongated passages therewith, said elongated passages extending parallel to said outer walls in the space therebetween;

at least one means for conducting a signal, continuous between two ends thereof and extending through at least one of said elongated passages in a configuration preventing passage of a human being through said panel means unless said at least one conducting means is severed; and

means for connecting said at least one conducting means at said two ends thereof to the alarm system in a continuity monitoring relationship therewith;

whereby passage of a human being through the area on the surface and through said panel means breaks the continuity of said at least one conducting means and causes the alarm system to produce the warning signal.

4,234,876

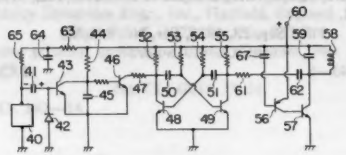
OMNIDIRECTIONAL MOVE-STOP SENSOR

Hiroshi Murai, Tokyo, Japan, assignor to Riken-Denshi Kogyo Kabushiki Kaisha and Morimura Shoji Kabushiki Kaisha, both of Tokyo, Japan

Filed May 20, 1977, Ser. No. 798,939
Claims priority, application Japan, Oct. 19, 1976, 51-125384; Oct. 27, 1976, 51-128244
Int. Cl.[3] G08B *23/00*; A01K *15/00*
U.S. Cl. 340—573 **10 Claims**

1. An omnidirectional move-stop sensor, comprising a movable ball placed within a confined space and voltage-inducing means at least partly defining a wall of said space for generat-

ing a voltage varying with impact on collision of said ball with said wall, said wall including a material generating a voltage on impact, said ball being freely movable along at least two dimensions during operation.



4,234,877

ION TYPE SMOKE SENSOR

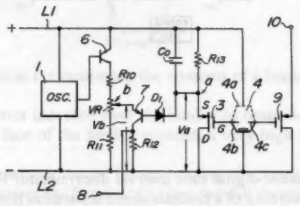
Masaki Maruyama, and Kohei Nakamura, both of Machida, Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Aug. 23, 1979, Ser. No. 69,080

Claims priority, application Japan, Aug. 26, 1978, 53-116220[U]

Int. Cl.³ G08B *17/10*; G01T *1/185*

U.S. Cl. 340—629 **10 Claims**



1. An ion type smoke sensor including a smoke sensing means having an internal electrode, an intermediate electrode and an external electrode, and a field effect transistor, having a control input terminal connected to said intermediate electrode, a first output terminal connected to said internal electrode and a second output terminal connected to said external electrode, for producing a sensing output between said first output terminal and said second output terminal, said ion type smoke sensor further comprising:

an oscillator circuit for generating an oscillating output having a predetermined oscillating frequency;

a reference level source for intermittently producing an output signal with a predetermined reference level in response to said oscillating output from said oscillator circuit; and

a comparing circuit for comparing said sensing output of said field effect transistor with said reference level from said reference level source to produce a fire sensing signal in accordance with the result of the comparison.

4,234,878

MONITORING DEVICE FOR THE PROPER OPERATION OF LAMPS PARTICULARLY IN MOTOR VEHICLES

Wolfgang Stark, Kriftel, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,516

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728229

Int. Cl.³ B60Q *9/00*

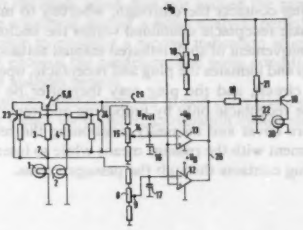
U.S. Cl. 340—642 **12 Claims**

1. A lamp burnout indicating circuit, particularly for monitoring at least one lamp constituting a first-mentioned lamp in motor vehicles, with a signal circuit, said at least one lamp being energizable from a circuit voltage, comprising

a resistor connected in series with the lamp operatively to said circuit voltage, said resistor having a small resistance in comparison with the resistance of said lamp,

said signal circuit including an indicator lamp,

at least one differential amplifier means for sensing a voltage at a point between said resistor and said first-mentioned lamp and providing an output signal for said indicator



lamp for actuating the latter when a defective condition of said first-mentioned lamp occurs,

a potentiometer means connected in series between said point and said differential amplifier means for adjusting said differential amplifier means according to characteristics of said first-mentioned lamp, and

transmission means for operatively applying a voltage drop across said resistor to said signal circuit for signalling a defective condition of said resistor.

4,234,879

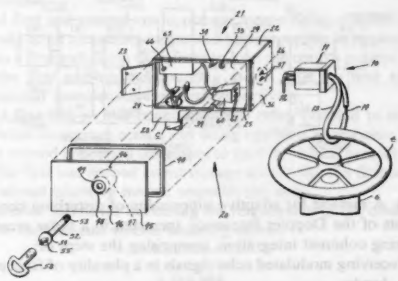
PLUG-TYPE SWITCH

Robert K. Baker, Elvins, Mo., assignor to Potter Electric Signal Co., St. Louis, Mo.

Filed Aug. 2, 1979, Ser. No. 62,991

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—686 **10 Claims**



1. A normally closed alarm switch device for use in supervision, by an alarm system, of the tetherable manual actuators of water valves and the like, comprising

a plug assembly including

a male electrical plug of the type having at least two contacts,

a loop of flexible insulated conductor by which such manual actuator is tethered, the conductor connecting two contacts of the male plug, the alarm switch device further comprising

a receptacle assembly including

a female electrical receptacle of the type having at least two contacts, each with an associated hook-up terminal, the receptacle being so formed as to mate for electrical con-

nection with the male plug, whereby the mated receptacle and plug assembly forms a closed switch circuit between the receptacle hook-up terminals, the receptacle assembly further including

an enclosure of such interior dimensions as to contain the female receptacle with freedom for movement of the receptacle, the enclosure having

an access opening to its interior,

a cover for the opening,

means to lock the cover in place at the opening, and

passage means into the enclosure to accept insertion of the male plug contacts therethrough, whereby to mate with the female receptacle contained within the enclosure,

whereby movement of such tethered manual actuator draws the loop and unmates the plug and receptacle, opening the switch circuit, and the plug may thereafter be remated with the receptacle only by unlocking and removing the enclosure cover and manually positioning the receptacle in alignment with the passage means while so inserting the male plug contacts through the passage means.

4,234,880

ADAPTIVE METHOD AND A RADAR RECEIVER FOR SUPPRESSION OF DISTURBING PORTIONS OF THE DOPPLER SPECTRUM

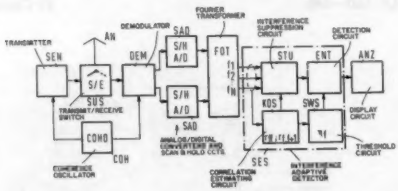
Richard Klemm, La Spezia, Italy, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 24, 1978, Ser. No. 963,359

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1977, 2752338

Int. Cl.³ G01S *13/02*

U.S. Cl. 343—5 FT **11 Claims**



1. A method for adaptive suppression of disturbing components of the Doppler frequency spectrum in a radar receiver having coherent integration, comprising the steps of:

receiving modulated echo signals in a plurality of frequency bands;

demodulating the echo signals in each frequency band and converting the same to digital signals;

performing a Fourier transformation on the digital echo values;

then comparing the echo value of a band with the echo value of at least one other band to measure the disturbing components and suppressing the disturbing components in the frequency band; and then

performing an approximate decorrelation by forming submatrices symmetrical with the principal diagonal from the power spectrum matrix in a suboptimal detection technique suitable for real-time operation, and detecting a Doppler frequency from a decorrelation value which is above a predetermined threshold.

4,234,881

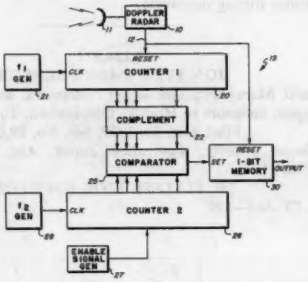
DYNAMIC DIGITAL TIME INTERVAL DISCRIMINATOR AND METHOD

Juris Stauers, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1978, Ser. No. 946,483

Int. Cl.³ G01S *13/58*

U.S. Cl. 343—8 **12 Claims**



5. A dynamic digital time interval discriminator for indicating the occurrence of a predetermined separation time between pairs of pulses in a sequence of pulses, which sequence is decreasing in repetition rate, the discriminator comprising:

(a) first counting means having a clock input terminal, a reset input terminal and a plurality of output terminals;

(b) second counting means having a clock input terminal, an enable signal input terminal and a plurality of output terminals;

(c) Doppler radar means having an output connected to the reset input of said first counting means for providing a sequence of Doppler pulses thereon;

(d) first signal generating means connected to the clock input terminal of said first counting means for providing a first clock signal at a first predetermined frequency relatively high compared to the sequence of Doppler pulses;

(e) second signal generating means connected to the clock input terminal of said second counting means for providing a second clock signal at a second predetermined frequency substantially lower than said first predetermined frequency;

(f) enable signal generating means connected to the enable signal input terminal of said second counting means for supplying an enable signal thereto;

(g) comparator means having a first plurality of input terminals connected to the output terminals of said first counting means, a second plurality of input terminals connected to the output terminals of said second counting means, and an output terminal for comparing signals at the outputs of said first and second counting means and providing an output signal when the signals compare; and

(h) output means having an input terminal connected to the output terminal of said comparator means, a reset terminal coupled to the reset terminal of said first counting means, and an output for providing a signal indicative of the occurrence of the predetermined time.

4,234,882

METHOD AND APPARATUS FOR MEASUREMENT OF THE CONTENTS OF A BUNKER OR SILO

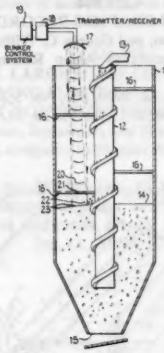
Lionel R. F. Thompson, Hatfield, England, assignor to Hawker Siddeley Dynamics Engr., Inc., Hatfield, England

Filed Feb. 5, 1979, Ser. No. 9,248

Claims priority, application United Kingdom, Feb. 24, 1978, 7436/78

Int. Cl.[3] G01S *13/34*

U.S. Cl. 343—14 7 Claims



1. Apparatus for measuring the contents of a bunker or silo, comprising

a transmitter mounted over the bunker to beam down on to the surface of the bunker contents a very high frequency signal,

sweep generator means for modulating the transmitted signal to cause the frequency to rise and fall repeatedly with either a constant sweep time and a progressively changing amplitude or a constant amplitude and a progressively changing sweep time,

a mixer responsive to both the transmitted signal and the target signal returns to deliver a beat frequency,

a filter for said beat frequency,

a control unit receiving the filtered beat frequency,

said control unit both controlling the sweep generator means and also computing from the filtered beat frequency the distance of the bunker contents surface below the transmitter as indicated by the particular frequency sweep of the transmitted signal with which each target return from the contents surface is associated,

said control unit including means for discriminating against target signal returns from fixed structure of the bunker which discriminating means comprises a long-term memory store for pre-storing signals corresponding to signal returns from fixed structure of the bunker,

a short-term memory store for receiving the incoming filtered beat frequency signals, and

comparator means for comparing the incoming beat frequency signals in the short-term store with the pre-stored signals in the long-term store and rejecting any of the incoming beat frequency signals that corresponds to a pre-stored signal.

4,234,883

NOISE ADAPTIVE CORRELATOR

Oscar J. Kaelin, Harvard, and Richard H. Mathews, Sudbury, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sep. 26, 1974, Ser. No. 509,708

Int. Cl.[3] H04B *7/00*

U.S. Cl. 343—100 CL 7 Claims

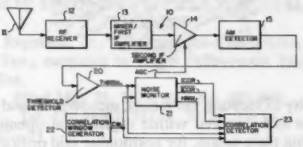
1. Apparatus for measuring the degree of correlation between input signals and correlation measurement pulses in the presence of input noise including

correlation pulse generating means for producing a continuous series of correlation measurement pulses;

correlation gating means for producing a correlation measurement coincidence pulse in response to the coincidence of an input signal and a correlation measurement pulse;

noise measuring means for determining whether or not input noise exceeds a predetermined noise condition during each of a series of noise analysis periods, said noise measuring means being operable to produce a first indication when the input noise does not exceed the predetermined noise condition during a noise analysis period and being operable to produce a second indication when the input noise exceeds the predetermined noise condition during a noise analysis period;

first counting means coupled to said correlation pulse generating means for counting correlation measurement pulses;



first count storage means coupled to said first counting means;

second counting means coupled to said correlation gating means for counting correlation measurement coincidence pulses;

second count storage means coupled to said second counting means;

said first and second count storage means being coupled to said noise measuring means and being operable in response to a first indication therefrom to load the counts present in the first and second counting means into the first and second count storage means, respectively;

said first and second counting means being coupled to said noise measuring means and being operable in response to a second indication therefrom to load the counts present in the first and second count storage means into the first and second counting means, respectively; and

indicator means for indicating the relationship of the counts in the first and second counting means.

4,234,884

INK JET PRINTER ASSEMBLY AND ALIGNMENT OF PRINTER COMPONENTS

James L. Vedder, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 1, 1979, Ser. No. 16,627

Int. Cl.[3] G01D *15/18*

U.S. Cl. 346—75 14 Claims

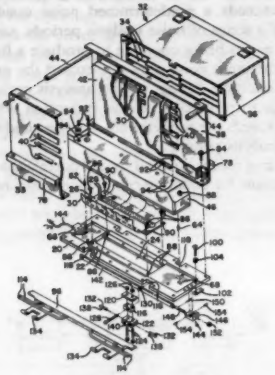
1. An ink jet printer for generating a plurality of fluid jet drop streams, comprising:

locating plate means defining a plate receiving recess and an opening within said recess through said locating plate means,

charge electrode plate positioned in said plate receiving recess and defining a plurality of electrode openings therethrough lined with charge electrodes,

print data conductors, connected electrically to said charge electrodes, for selectively supplying charge control signals thereto,

print head means including a fluid receiving reservoir and an orifice plate communicating therewith, said orifice plate defining a plurality of orifices from which fluid jet drop streams emerge,



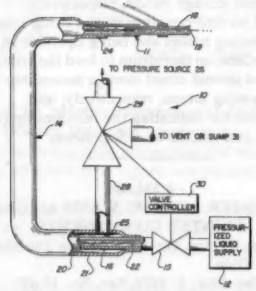
a plurality of locating pin means, mounted on said print head means and received within registration openings in said locating plate means, for positioning said orifice plate with respect to said charge electrode plate such that each of said plurality of orifices is aligned with a respective one of said electrode openings defined by said charge electrode plate, whereby fluid drops in each jet stream are selectively charged in correspondence with said charge control signals.

4,234,885

REMOTE INK VALVE

George W. Arway, River Grove, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed Sep. 10, 1979, Ser. No. 73,843
Int. Cl.³ G01D *15/18*; F16L *55/04*; B65D *37/00*
U.S. Cl. 346—140 R **6 Claims**



1. In a liquid flow system having a head which is supplied from a source with pressurized liquid that is expelled by the head, the combination comprising:

a first conduit of elastic material connecting the liquid source with the head for conveying liquid thereto;

first means connected to said first conduit for controlling the flow of liquid conveyed through said first conduit to be expelled from the head;

a second conduit extending between the head and said valve and surrounding said first conduit for providing a pressurizable jacket about said first conduit, and

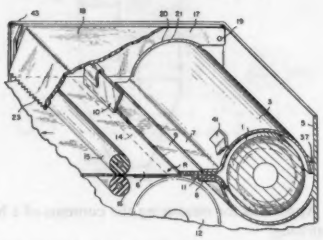
second means connected to said jacket for controlling the pressure applied to said first conduit to prevent the expansion thereof, said flow of liquid from said head being terminated substantially immediately upon operation of said first and second means for terminating the flow of liquid in said first conduit and for relieving the pressure in said jacket.

4,234,886

ELECTRIC GRAPHIC RECORDER

John M. Alden, Needham, and George C. Williams, So. Easton, both of Mass., assignors to Alden Research Foundation, Brockton, Mass.

Filed Jan. 22, 1979, Ser. No. 5,244
Int. Cl.³ G01D *15/06, 15/24, 15/26*
U.S. Cl. 346—165 **7 Claims**



1. A graphic recorder of electrical signals on a moist recording web drawn on a path from a roll to between a scanning electrode and a linear electrode; said recorder comprising:

a frame and a well disposed upon said frame for holding said moist recording web;

a cover demountably disposed over said well and arranged to form a humidor and retain moisture in the roll;

means for holding the roll of recording web in said well, said means being arranged so that the axis of the roll is aligned parallel to the linear electrode;

a mouth formed between said well and said well cover for the emergence of moist web and means on said mouth for retaining moisture within said well; and

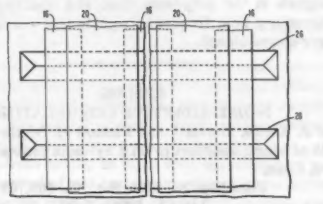
a recorder cover hinged to the frame, and means on the recorder cover positioned to engage the well cover to urge the well cover to a position sealing the humidor well.

4,234,887

V-GROOVE CHARGE-COUPLED DEVICE

Wilbur B. Vanderslice, Jr., Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1979, Ser. No. 41,975
Int. Cl.³ H01L *29/78, 29/06, 29/04*; G11C *19/28*
U.S. Cl. 357—24 **7 Claims**



1. A charge transfer device comprising:

a semiconductor substrate having at least one longitudinal

recess having a length substantially greater than its width formed in a surface thereof;

a plurality of longitudinal charge transfer electrodes positioned over and substantially perpendicular to said recess for effecting charge transfer of carriers from under an electrode to under an adjacent electrode within and along the length of said recess in response to signals applied to said electrodes; and

isolation means between said charge transfer electrodes and the portions of said surface of said substrate adjacent to said recess for preventing charge transfer from occurring in said portions of said surface in response to said signals.

4,234,888

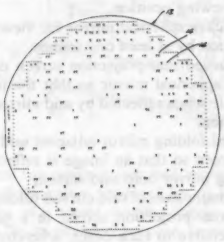
MULTI-LEVEL LARGE SCALE COMPLEX INTEGRATED CIRCUIT HAVING FUNCTIONAL INTERCONNECTED CIRCUIT ROUTED TO MASTER PATTERNS

Donald F. Calhoun, Inglewood, and Barry Bennett, Wilmington, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 209,397, Dec. 17, 1973, Pat. No. 3,795,975, which is a continuation of Ser. No. 16,840, Mar. 5, 1970, abandoned. This application Jul. 26, 1973, Ser. No. 382,993

Int. Cl.³ H01L *27/04*

U.S. Cl. 357—45 **21 Claims**



1. A multi-level complex integrated circuit of the type which defines a configuration of signal-connect portions, vias and integrated circuits which are the same in location for a plurality of wafers having the same functional circuit type, including:

a wafer having a plurality of cells in a nonstandard yield distribution of usable cells;

a first level of means for defining dielectric insulation formed on said wafer and having means for defining vias formed through said insulation for exposing signal-connects of selected ones of said usable cells;

a first level of metalization formed on said first level dielectric insulation means including electrical conductor means routed between and from said exposed signal connects of said usable cells to signal-connect portions for interconnecting at least one of said selected usable cells into at least one functional circuit, and for defining a routing of said signal-connects of said selected usable cells to locations of circuits corresponding to the configuration of signal-connect portions which is the same for the plurality of the wafers having the same functional circuit type, at least one of said signal-connect portions being positioned substantially directly above at least one of said signal-connects and at least one other of said signal-connect portions being positioned above and substantially laterally spaced from at least a corresponding one of said signal-connects;

a second level of means for defining dielectric insulation formed on said electrical conductor means and having means for defining vias formed through said second level dielectric insulation means corresponding to a configuration of means for defining the vias which is the same for the plurality of the wafers having the same functional circuit type for having exposed said signal-connect portions of said electrical conductor means at the circuit locations; and

at least a second level of metalization formed on said second level of dielectric insulation means including means for defining electrical interconnects routed between and from said exposed signal-connect portions at the circuit locations and corresponding to the configuration of integrated circuits which is the same for the plurality of the wafers having the same functional circuit type for having interconnected said selected usable cells into the functional circuit type.

4,234,889

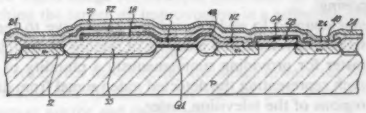
METAL-TO-MOAT CONTACTS IN N-CHANNEL SILICON GATE INTEGRATED CIRCUITS USING DISCRETE SECOND-LEVEL POLYCRYSTALLINE SILICON

Joseph H. Raymond, Jr., Katy, and Jih-Chang Lien, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 31, 1977, Ser. No. 801,698

Int. Cl.³ H01L *23/48, 29/46, 29/54*

U.S. Cl. 357—71 **6 Claims**



1. A contact and interconnection arrangement for a semiconductor integrated circuit of the type having circuit elements formed at a face of a semiconductor body, a plurality of levels of contacts and electrode areas and interconnections at said face of the body, the levels including at least one level of polycrystalline silicon and one of metallization on the face as well as elongated regions of monocrystalline semiconductor material in the face, said elongated regions being of opposite conductivity-type and more heavily doped than surrounding material in said face, a first insulating layer on said face between the semiconductor material and said at least one level of polycrystalline silicon and a second insulating layer on said face between said at least one level of polycrystalline silicon and said level of metallization, the improvement wherein: a connection between a contact part of the level of metallization and a contact area on a part of an elongated region of the semiconductor material includes a discrete area of one of the levels of polycrystalline silicon, said discrete area being substantially uniformly doped with impurity between said contact part of the level of metallization and said contact area of said elongated region, said discrete area being solely for the purpose of making electrical connection from said contact part of the level of metallization and said contact area and not being a part of or being connected to said circuit elements except through said contact part of the level of metallization and said contact area on said part of said elongated region of semiconductor material, said discrete area contacting said contact area through a first aperature in said first insulating layer, said first aperature being smaller than said discrete area, said contact part contacting said discrete area through a second aperature in said second insulating layer, said second aperature being smaller than said contact part.

4,234,890
AUTOMATIC SETUP SYSTEM FOR TELEVISION CAMERAS

Brian Astle, Princeton, and Robert A. Dischert, Burlington, both of N.J., assignors to RCA Corporation, New York, N.Y.

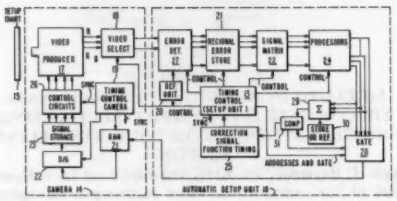
PCT No. PCT/US79/00099, § 371 Date Feb. 22, 1979, § 102(e) Date Feb. 22, 1979, PCT Pub. No. WO 79/00717, PCT Pub. Date Oct. 4, 1979

This PCT application Filed Feb. 22, 1979, Ser. No. 24,737

Claims priority, application United Kingdom, Mar. 6, 1978, 08836/78

Int. Cl.³ H04N *9/62, 9/04, 5/24*

U.S. Cl. 358—10 **17 Claims**



1. A system for automatic adjustment of a television camera, comprising:

means coupled to said camera and responsive to the video signals therefrom at a plurality of regions of the television raster for providing simultaneously a plurality of signals each representing the detected video signal from different regions of the television raster,

second means coupled to said first means and responsive to the signals simultaneously provided for selectively and separately processing said detected signals without reexamining the video signal for providing a plurality of corresponding camera adjustment signals, and

means coupled to said camera and responsive to said adjustment signals for adjusting said camera.

10. A system for automatic adjustment of a color television camera for correcting for registration errors between two color video signals with said camera viewing a test chart having a plurality of identical test marks equally distributed in rows and columns, comprising:

first means including measuring means coupled to said camera and responsive to said two color video signals for providing simultaneously horizontal and vertical error signals associated with each of the identical marks representing in each mark location the horizontal and vertical positional errors between the two video signals,

second means coupled to said first means and responsive to said horizontal and vertical error signals from each mark location for selectively and separately processing said error signals for horizontal centering, horizontal size, horizontal bow, horizontal tilt and horizontal linearity, vertical centering, vertical size, vertical bow, vertical tilt and vertical linearity, without remeasuring the errors for providing separate camera adjustment signals for horizontal centering, horizontal size, horizontal bow, horizontal tilt and horizontal linearity, vertical centering, vertical size, vertical bow, vertical tilt and vertical linearity, and

third means coupled to said camera and responsive to the adjustment signals for adjusting said camera according to all of said adjustment signals before remeasuring for errors.

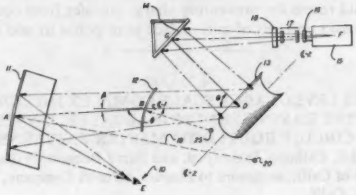
4,234,891
OPTICAL ILLUMINATION AND DISTORTION COMPENSATOR

James C. Beck, La Canada, and Harrie W. Nielsen, Pasadena, both of Calif., assignors to The Singer Company, Binghamton, N.Y.

Filed Jul. 30, 1979, Ser. No. 62,446

Int. Cl.³ H04N *7/18*; G09C *9/00*; G02B *17/00, 9/08*

U.S. Cl. 358—104 **17 Claims**



1. A method of compensating for the distortion developed in an optical display apparatus due to the imposition of a concave spherical mirror for viewing intermediate a viewing position and a curved rear-projection screen and for improving the illumination substantially simultaneously, comprising:

establishing a viewing position,

arranging a concave spherical mirror for viewing from said viewing position by at least one trainee,

positioning a curved rear-projection screen on the side of said concave spherical mirror so that the image on said screen is visible when reflected by said mirror toward said viewing position,

locating a curved folding mirror adjacent said curved rear-projection screen so that an image is reflected from the curved folding mirror onto said screen,

positioning the major axes of said curved folding mirror and said curved rear-projection screen in a predetermined relationship relative to each other, whereby distortion is reduced and illumination increased substantially simultaneously; and

projecting an image for reflection from said curved folding mirror onto said curved rear-projection screen so that said image is viewed at said viewing position substantially undistorted and with substantially maximum illumination.

4,234,892
AGC CIRCUIT RESPONSIVE TO INTERMEDIATE GRAY LEVEL IN VIDEO SIGNAL

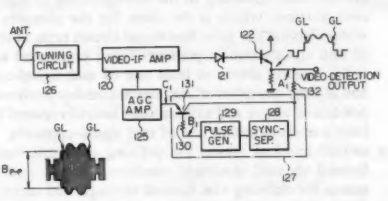
Hidetoshi Mochizuki, Kokubunji, and Masataka Okada, Konosu, both of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 972,700

Claims priority, application Japan, Dec. 29, 1977, 52-159502

Int. Cl.³ H04N *5/52*

U.S. Cl. 358—174 **1 Claim**



1. An automatic gain control circuit for an amplitude modulated receiver system for receiving an amplitude modulated video signal of the type having a gray level of a constant

amplitude existing intermediately between a black level and a white level for use as a reference level, said circuit comprising:

video intermediate frequency amplifier means for receiving said amplitude modulated video signal,

means connected to the output of said amplifier means for generating a video detection output signal in response to said video signal, and

means connected to the output of said generating means for detecting the gray level from said video detection output signal and for generating an output signal representing the amplitude of the gray level signal during the existing period of said gray level,

whereby said output signal representing the amplitude of said gray level signal is used as an AGC voltage by said amplifier means.

4,234,893

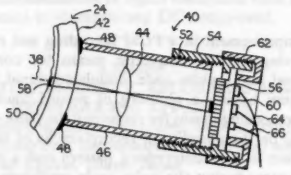
IMAGE DRIFT CORRECTION APPARATUS

David L. Peters, Whitney Point, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,462

Int. Cl.³ H04N *3/22*

U.S. Cl. 358—180 **9 Claims**



1. Apparatus for continuously and accurately maintaining the location of the raster produced by an energy beam on a display surface of a visual system, during operation of said visual system for its intended purpose, comprising:

optical sensing means mounted to said display surface outside of the viewing area for continuously monitoring the position of a selected portion of the path of a raster line also outside of the viewing area on said display surface during operation of said visual system for its intended purpose, said optical sensing means for determining the position of said selected portion of a raster line with respect of the location of said optical sensing means and for providing an electrical signal representative thereof;

said optical sensing means having a support structure, a photosensitive device having a multiplicity of linearly arranged photosensitive elements mounted in said support structure, said photosensitive device being oriented such that said linear arrangement is substantially at a right angle with respect to said monitored raster line path;

means mounted to said support structure between said display surface and said photosensitive device for imaging said monitored raster line path onto an area of said multiplicity of photosensitive elements, said area varying according to changes in the location of said monitor raster line path on said display surface;

circuitry for detecting which of said elements said image of said monitored raster line path impinges, and for providing said signals representative of the position of said selected portion of said raster line;

means for receiving said electrical signal, and for comparing said electrical signal with a predetermined stored reference signal representative of said selected portion of the path of a raster line properly located on said display surface, and for generating a control signal representative of the difference between said reference signal and said electrical signal; and

means for combining said control signal with sweep drive signals which are produced during operation of said visual system for its intended purpose for deflecting said energy beam to produce resulting sweep drive signals which maintain said raster scan in a selected location to provide a scene properly positioned on said display surface.

4,234,894

REFLECTING OPTICAL SYSTEM FOR PROJECTION TELEVISION

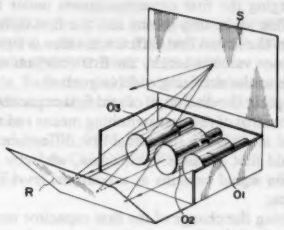
Hisashi Tokumaru, Osaka, and Mitsuo Yasukuni, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 26, 1978, Ser. No. 955,097

Claims priority, application Japan, Nov. 2, 1977, 52-131807

Int. Cl.³ H04N *5/72*; G02B *17/00, 9/34*

U.S. Cl. 358—250 **9 Claims**



1. In a projection television system including a light emitting target capable of providing a video image of a high resolution definition of 1,000 T.V. lines and a screen for realizing the projected video image for example generated by an electron gun exciting the target, an improvement in a reflecting optical system which defines an optical path for projecting the video image on the screen, comprising;

a concave mirror for reflecting the image toward the screen;

a meniscus lens located in the optical path between the concave mirror and the screen;

at least one optical aspherical surface in the optical path, whereby the aspherical surface coefficient, C_2; radius of curvature of the inside surface of the meniscus lens, R, and the focal length, f, of the entire optical system satisfies the following conditions;

$$10^{-2}/f^4 < |C_2| < 10^2/f^4 \quad (1)$$

$$0.6f < |R| < 1.2f \quad (2)$$

these conditions providing a projection television system with a resolution of 1,000 T.V. lines on the screen.

4,234,895

CONVERTING A VIDEO SIGNAL INTO A TWO-LEVEL SIGNAL

Rudiger Sommer, and Hermann Wischer, both of Kiel, Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Jan. 3, 1979, Ser. No. 671

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1978, 2800759

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—282 **9 Claims**

1. In a method usable in a facsimile scanner for converting a video signal obtained by scanning an original point by point and line by line into a two-level signal, wherein first and second companion signals are generated to derive a threshold signal from said companion signals, which follows the video signal dynamically, and wherein said video signal and said threshold signal are compared to obtain said two-level signal, the method comprising the steps of generating said first and second companion signals:

charging first capacitor means, the voltage of which corre-

sponds to said first companion signal, to the actual level of the video signal under the control of first switching means when said video signal rises until the maximum level of the video signal is reached, whereby the first companion signal substantially follows a rise in said video signal;

interrupting the charge of the first capacitor means by said first switching means under the control of the video signal at the maximum level of the video signal, whereby the first companion signal remains at a constant level in the first instance when said video signal declines;

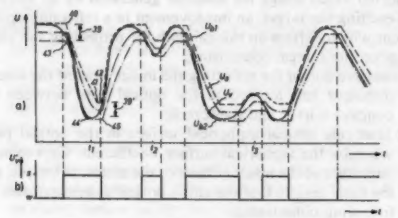
generating a first distance value from said video signal by generator means;

determining continuously actual first difference values between the first companion signal and a first reference signal by first differential means;

discharging the first capacitor means under the control of the first switching means and the first differential means when the actual first difference value is equal to said first distance value, whereby the first companion signal comes close to the decrising video signal;

interrupting the discharge of said first capacitor means under the control of the first switching means and the first differential mean when the actual first difference value is equal to said first distance value again, whereby the first companion signal remains at a constant level in the first instance;

continuing the charge of the first capacitor means under the control of the first switching means when the first companion signal substantially coincides with the rising video signal, whereby the first companion signal follows the rising video signal again;



discharging second capacitor means, the voltage of which corresponds to said second companion signal, to the actual level of the video signal under the control of second switching means when said video signal decrises until the minimum level of the video signal is reached, whereby the second companion signal substantially follows a decrise in said video signal;

interrupting the discharge of said second capacitor means by said second switching means under the control of the video signal at the minimum level of the video signal, whereby the second companion signal remains at a constant level in the first instance when said video signal rises;

generating a second distance value from said video signal by said generator means, whereby said first and second distance values are proportional to the mean brightness values of the background of the original to be scanned;

determining continuously actual second difference values between the second companion signal and a second reference signal by second differential means;

charging the second capacitor means under the control of the second switching means and the second differential means when the actual second difference value is equal to said second distance value, whereby the second companion signal comes close to the rising video signal;

interrupting the charge of said second capacitor means under the control of the second switching means and the second differential means when the actual second difference value is equal to said second distance value again, whereby the second companion signal remains at a constant level in the first instance;

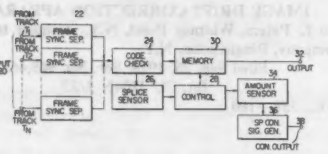
continuing the discharge of the second capacitor means under the control of the second switching means when the second companion signal substantially coincides with the decrising video signal, whereby the second companion signal follows the decrising video signal again.

4,234,896

PCM RECORDING AND REPRODUCING SYSTEM

Ken Onishi, and Kunimaro Tanaka, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1978, Ser. No. 959,777
Int. Cl.³ G11B 5/00, 5/09, 27/02; H04W 5/78
U.S. Cl. 360—32 **7 Claims**



1. An improvement in a PCM recording and reproducing system having a PCM converter means for converting an analog signal into a pulse code modulated signal, a PCM record medium having a plurality of record tracks disposed thereon, a recording means for recording the pulse code modulated signal on the plurality of record tracks of the PCM record medium in a predetermined pattern and a reproducing means for reproducing the pulse code modulated signal recorded on the PCM record medium, said improvement comprising:

a memory means in said reproducing system having a predetermined storage capacity for storing data therein;

a writing means connected to said memory means and having the reproduced pulse code modulated signal applied thereto, for continuously storing the reproduced pulse code modulated signal in said memory means;

a reading means connected to said memory means for continuously reading the data stored in said memory means after a time delay from the time said data was stored in said memory means;

a splice sensing means for sensing errors in the patterns in adjacent positions in a plurality of adjacent tracks in the direction transverse to the tracks and thereupon indicating the presence of a splice in the PCM record medium; and

a writing suspension means connected to said writing means and said splice sensing means for suspending the writing of the pulse code modulated signal in said memory means upon generation of said splice signal.

4,234,897

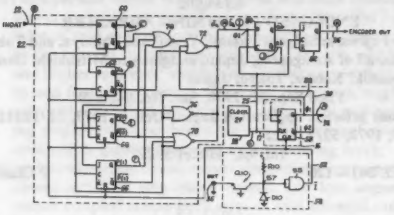
DC FREE ENCODING FOR DATA TRANSMISSION

Jerry W. Miller, Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 5, 1978, Ser. No. 948,725
Int. Cl.² G11B 5/09
U.S. Cl. 360—45 **6 Claims**

1. In a self-clocking transmission system for transmitting binary data bits sequentially in successive clocked bit cells of a transmission channel wherein logical first bit states are normally transmitted as signal transitions relatively early in the respective bit cells and logical second bit states are normally transmitted as signal transitions relatively late in the respective bit cells and any transition relatively early in a bit cell following a transition relatively late in the next preceding bit cell is normally suppressed, apparatus for modifying the transmitted signal to remove any net DC component, said apparatus com-

prising first indicating means responsive to first bit states for counting the number of first bit states and producing at the onset of a sequence of second bit states following a first bit state a first indicating signal when the number of first bit states is of predetermined parity indicating any such sequence that might introduce a DC component into the transmitted signal with normal transmission, second indicating means responsive



to bit states for producing a second indicating signal indicating whether the number of second bit states occurring in such sequence prior to a current bit is odd or even, and transition modifying means responsive to said first and second indicating signals and to the current bit and the next succeeding bit for modifying the transmission of signal transitions from the onset of such sequence to eliminate any DC component.

4,234,898

DIGITAL MAGNETIC RECORDING AND REPRODUCING APPARATUS

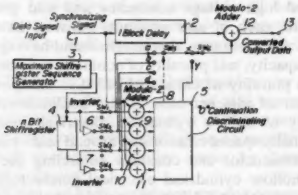
Shozo Nakagawa; Katsuya Yokoyama, both of Machida, and Hironobu Katayama, Sagamihara, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed Mar. 12, 1979, Ser. No. 19,592

Claims priority, application Japan, Mar. 15, 1978, 53/28757; Mar. 16, 1978, 53/29221; Aug. 1, 1978, 53/93092

Int. Cl.[3] G11B *5/09*

U.S. Cl. 360—41 **9 Claims**



1. A digital magnetic recording and reproducing apparatus, wherein a digital code signal is recorded and reproduced magnetically, comprising:

a first signal generating means for generating a first digital signal provided for preventing the continuation of the same signal levels in said digital code signal;

a first adder for effecting a code conversion by modulo-2-adding together said digital code signal and said first digital signal;

a recording means for recording an output signal derived from said first adder on a magnetic carrier;

a reproducing means for reproducing said output signal from said magnetic carrier;

a threshold level generating means for generating a threshold level comprising a compensator and at least two peak rectifiers which treat an applied input signal derived from said reproduced signal with the same time-constant respectively;

a level comparator for correcting the waveform of said applied input signal by comparing said applied input signal with said threshold level derived from said threshold level generator;

a second signal generating means for generating a second digital signal provided for restoring said code conversion; and,

a second adder for modulo-2-adding together a corrected output signal derived from said level comparator and said second digital signal, so as to restore said digital code signal.

4,234,899

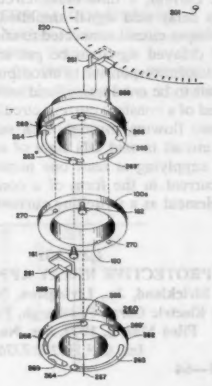
KEYED MOUNTING FOR ORIENTING OPTICAL ANGULAR, DISPLACEMENT TRANSDUCER IN RIGID MAGNETIC DISC MEMORY

Michael Feldstein, Sudbury, and Harold L. Thackaberry, Franklin, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 25, 1978, Ser. No. 899,944

Int. Cl.[3] G11B *19/28*

U.S. Cl. 360—73 **4 Claims**



1. In memory apparatus supported by a base and intended for use in a digital computer system, said apparatus comprising a spinable and rigid magnetic disc for recording digital information, motor means including a spinable shaft for driving said disc about its spin axis, and a transducer system including a transducer for measuring at least angular displacement of said disc from a reference fixed to said base, said transducer system comprising:

a transducer-related disc having means mounted thereon for communicating with said transducer, said transducer-related disc being mounted on said shaft and spinable therewith;

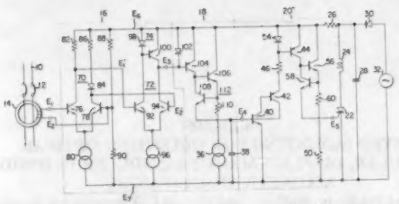
said transducer having transmitting and receiving devices, and oriented to permit passage of said transducer-related disc between said devices to alternately permit and prevent communication between said devices; and

an upright member for supporting said transducer, said upright member including a base lip for connection to said base, said base and said base lip having keying means for constraining the mounting of said transducer system to said base to a predetermined orientation thereby precluding incorrect insertion or removal, whereby said transducer-related disc is constrained to pass between said devices and damage to said transducer system is inherently avoided.

4,234,900
GROUND FAULT DETECTOR

Yukio Miyazaki, and Mitsugu Taketa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1979, Ser. No. 27,018
Claims priority, application Japan, Apr. 11, 1978, 53/42963
Int. Cl.³ H02H 3/26
U.S. Cl. 361—45 **6 Claims**

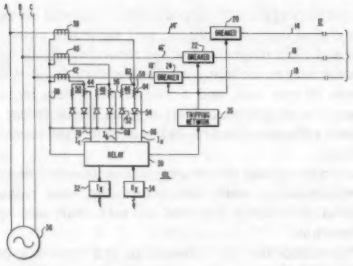


1. A ground fault detector comprising, in combination, a ground fault sensor for sensing a ground fault occurring in an AC line to produce a sensed current, an amplifier connected to said ground fault sensor to amplify a signal representative of said sensed current, a time delay circuit connected to said amplifier to delay said signal amplified by said amplifier, a waveform shaper circuit connected to said time delay circuit to receive the delayed signal to be put in its ON state, and a switching element responsive to an output from said waveform shaper circuit to be conducting, said waveform shaper circuit being formed of a constant current circuit for decreasing operating currents flowing through both said amplifier and said time delay circuit in said ON state of said waveform shaper circuit and supplying at least one portion of said decreased operating current in the form of a constant current to said switching element as a switching current.

4,234,901
PROTECTIVE RELAY APPARATUS

William A. Strickland, Jr., Livingston, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 8, 1979, Ser. No. 18,706
Int. Cl.³ H02H 7/26
U.S. Cl. 361—64 **6 Claims**



1. Protective relay apparatus for protecting a three-phase power line section having first, second and third phase currents flowing between first and second line ends of the protected section, comprising:

first means at each line and providing one of first, second and third signals indicative of the largest of the first, second and third phase currents, respectively, flowing at any instant;

second means at each line end for communicating the first, second and third signals to the other line end;

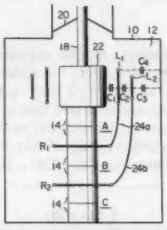
third means at each line end for phase comparing each of the first, second and third signals from its line end with the like numbered signal from the other line end; and

fourth means for isolating the protected section in response to a predetermined phase relationship between any pair of compared signals.

4,234,902
ENCLOSED LIGHTNING ARRESTER

Yukio Fujiwara; Shigeru Yamaji; Yoshikazu Shibuya, and Tohei Nitta, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1978, Ser. No. 946,829
Claims priority, application Japan, Oct. 7, 1977, 52/121121; Oct. 7, 1977, 52/121122
Int. Cl.³ H02H 3/22
U.S. Cl. 361—120 **9 Claims**



1. An enclosed lightning arrester device comprising, in combination, a grounded metal enclosure, a high voltage conductor adapted to be connected to an electric power device to be protected and extending into said grounded metal enclosure, a cylindrical high voltage conductor connected to the end of said high voltage conductor located within said grounded metal enclosure and coaxial with said high voltage conductor, a plurality of nonlinear resistors disposed within said grounded metal enclosure and series connected between said cylindrical high voltage conductor and said grounded metal enclosure, each of said nonlinear resistors having an excellent nonlinear resistance characteristic and having a high electrostatic capacity, said plurality of nonlinear resistors being divided into a plurality of units, a shield disc interposed between each pair of adjacent units of said nonlinear resistors, and a plurality of hollow cylindrical electrical conductors disposed in radially spaced relationship around said cylindrical high voltage conductor and coaxially encircling the latter, each of said hollow cylindrical electrical conductors being electrically connected to a different one of said shield discs.

4,234,903
INDUCTIVE LOAD DRIVER CIRCUIT EFFECTING SLOW HOLD CURRENT DELAY AND FAST TURN OFF CURRENT DECAY

Patrick D. Harper, Seaford, Va., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 27, 1978, Ser. No. 881,326
Int. Cl.² H03K 1/14
U.S. Cl. 361—154 **2 Claims**

1. A circuit for controlling current from a power supply to the solenoid coil of an electromagnetically activated armature in response to a command pulse having a beginning and an end bounding an actuating portion and a holding portion, the current in said actuating portion increasing to an actuating current level sufficient to overcome a bias causing the armature to move from a first position to a second position and the current in said holding portion decreasing to a range sufficient to maintain the armature in said second position, said circuit comprising:

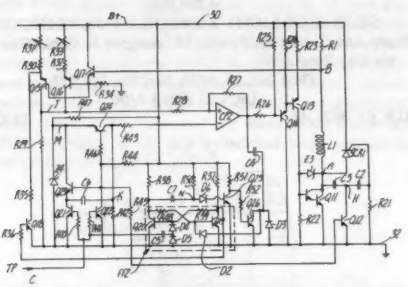
(a) power switch means coupled to said power supply and adapted to be coupled to a one of first and second sides of

said solenoid coil, said power switch means responsive to first and second inputs thereto to alternately complete and interrupt a charging current path between said power supply and said solenoid coil;

(b) reference means for generating a lower and higher reference value representing respectively a lower level and a higher level of said holding current;

(c) comparator means coupled to said reference means, said power switch means, and a one of said first and second sides of said solenoid coil for comparing a representation of the current through the solenoid coil with said lower and higher reference values and generating said first input to said first switch means when said current through said solenoid is less than said lower holding level and generating said second input when said current through the solenoid coil is greater than said higher holding level;

(d) solenoid current decay means comprising low impedance means and high impedance means, said low impedance means coupled across both sides of said solenoid coil and being enabled by the presence of said command pulse to establish a low impedance current path through said solenoid coil when the charging current path is interrupted,



said low impedance means comprising silicon controlled rectifier means, and said high impedance means coupled across both sides of said solenoid coil having an impedance value higher than said low impedance means to establish a high impedance current path through said solenoid coil;

(e) SCR turn off means coupled to said power switch means responsive to the termination of said command pulse to momentarily cause said power switch means to complete said charging current path so as to rapidly turn off said silicon controlled rectifier means by diverting current therefrom; and

(f) said low and high impedance means cooperating with the inductance of said solenoid coil to establish respective slow and fast L/R decay rates for the current through the coil so that said slow L/R decay rate allows said holding current to flow through said solenoid coil prior to the end of said command pulse even though said power switch interrupts said path between said power supply and said solenoid coil and so that said fast L/R decay allows said armature to be rapidly biased back to its first position after the end of said command pulse.

4,234,904

PROCESS AND DEVICE FOR THE PROTECTION OF ELECTRICAL ENERGY SUPPLY SYSTEMS CONTROLLED BY MEANS OF AUDIO-FREQUENCY

Kjell T. Fahlesson, Tyreso, Sweden, assignor to LGZ Landis & Gyr Zug AG, Switzerland

Filed Jul. 18, 1979, Ser. No. 58,617

Claims priority, application Switzerland, Jul. 19, 1978, 7775/78

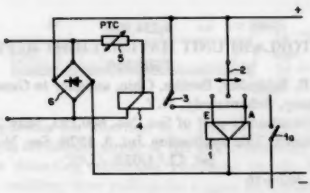
Int. Cl.³ H01H 47/26

U.S. Cl. 361—165 **7 Claims**

2. Apparatus for protecting electrical energy supply systems wherein supply to secondary loads is normally controlled by means of audio-frequency signals, said apparatus comprising

a two-state switching relay,

a normal control path coupled to said relay for controlling the state of said switching relay under normal conditions to control the secondary loads, and



an additional control path coupled to said relay to momentarily energize said relay in a direction which momentarily assures disconnection of the secondary loads, prior to reaching ¾ maximum supply voltage following interruption of the electrical energy supply.

4,234,905

ELECTRICAL CONDENSER

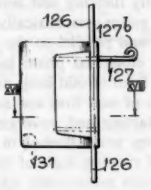
Jacques Benezech, Le Vesinet, France, assignor to NOVI P.B. Societe Anonyme, Pantin, France

Filed Mar. 21, 1978, Ser. No. 888,786

Claims priority, application France, Mar. 22, 1977, 77 08465; Feb. 10, 1978, 78 03751

Int. Cl.³ H01G 1/14

U.S. Cl. 361—307 **8 Claims**



1. In a condenser wherein first and second conductive strips are wound together with insulating strips to form an elongated condenser body having longitudinally opposite first and second ends provided with respective first and second terminals connected to the first and second conductive strips, the improvement wherein:

a mass of material permeates said body and bonds said strips together into a rigid block;

said conductive strips are both substantially narrower than said insulating strips and are longitudinally offset from each other with said first strip terminating short of said second end and said second strip terminating short of said first end;

said body is formed at said ends with respective first and second transversely extending socket holes, said first conductive strips being exposed in said first hole and said second conductive strip being exposed in said second hole;

said terminals have respective first and second connection parts respectively tightly received in said first and second holes in good electrical contact with said first and second conductive strips; and

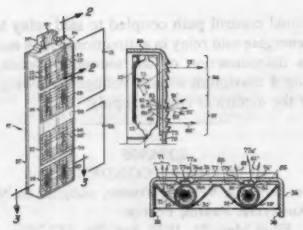
a hard casing of insulating material tightly surrounds said condenser body, said first terminal being a ground lug extending longitudinally along said body, imbedded in said casing, exposed at both ends of said body, and having

a throughgoing hole through which said second terminal extends.

4,234,906
PHOTOFLASH UNIT HAVING LIGHT-REFRACTIVE PRISMS

Donald R. Schindler, Burton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 800,193, May 25, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,430
Int. Cl.³ G03B 15/02
U.S. Cl. 362—16 22 Claims



1. A photoflash unit comprising an elongated flash lamp which when flashed emits light over a wider angle than the viewing angle of a normal camera lens, a reflector having reflective areas laterally flanking said lamp, and first two or more elongated prism means symmetrically positioned directly in front of said lamp and parallel to the axis thereof, and a second two or more elongated prism means symmetrically positioned directly in front of said lamp and perpendicular to the axis thereof, each of said first and second prism means being shaped for refracting and coverging light emanating directly from said lamp when flashed in a more frontward direction and into said viewing angle of the camera lens so as to increase the brightness substantially uniformly within said viewing angle. .

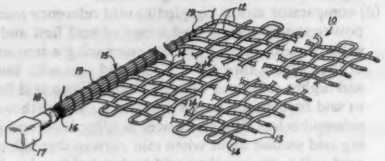
8. A photoflash unit comprising an elongated flash lamp which when flashed emits light over a wider angle than the viewing angle of a normal camera lens, a reflector having spectral reflective areas laterally flanking said lamp and shaped to reflect light from said lamp when flashed in a desired pattern, and two or more elongated prism means symmetrically positioned directly in front of said lamp and parallel to the axis thereof, said prism means being shaped for refracting and converging light emanating directly from said lamp when flashed in a more frontward direction and into said viewing angle of the camera lens so as to increase the brightness substantially uniformly within said viewing angle, there being no prism means parallel to said lamp axis directly in front of said reflective areas of the reflector.

15. A photoflash unit comprising an elongated flash lamp which when flashed emits light over a wider angle than the viewing angle of a normal camera lens, a reflector having nonspectral reflective areas laterally flanking said lamp, and two or more elongated prism means symmetrically positioned directly in front of said lamp and parallel to the axis thereof, said prism means being shaped for refracting and converging light emanating directly from said lamp when flashing in a more frontward direction and into said viewing angle of the camera lens so as to increase the brightness substantially uniformly within said viewing angle.

4,234,907
LIGHT EMITTING FABRIC

Maurice Daniel, 550 Jaycox Rd., Avon Lake, Ohio 44012

Filed Jan. 29, 1979, Ser. No. 7,592
Int. Cl.³ F21V 7/04
U.S. Cl. 362—32 35 Claims

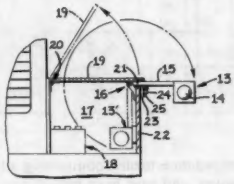


1. A light emitting fabric comprising a woven plurality of optical fibers, each of which fibers is deformed at discrete intervals along the length thereof to allow light to radiate therefrom.

4,234,908
STORABLE LIGHT ASSEMBLY FOR VEHICLES

Mary Ann C. McGee, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 10, 1978, Ser. No. 923,123
Int. Cl.³ B60Q 1/06
U.S. Cl. 362—66 11 Claims



1. A vehicle (10) comprising
means for defining a receptacle (17) on a side of said vehicle,
means for defining a window (27) in said receptacle, said window exposed towards one of the forward and rearward ends of said vehicle, and
a light assembly (13) mounted on the side of said vehicle comprising
a light (14), and
mounting means (15) for movably mounting said light on said vehicle for movement between a stored, operating position within said receptacle to align said light with said window and an extended, operating position remote from said stored operating position, and on a lateral side of said vehicle, said light pointing towards said one of the forward and rearward ends of said vehicle in each of its stored and extended positions.

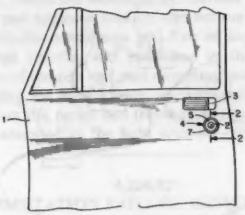
4,234,909
ILLUMINATED DOOR LOCK

Peter R. Cotroneo, 63 Smithtown Polk Blvd., Centereach, N.Y. 11720

Filed Jun. 15, 1978, Ser. No. 915,894
Int. Cl.³ E05B 17/10
U.S. Cl. 362—100 2 Claims

1. An illuminated door lock which comprises in combination with a door, a lock which fits into an aperature in said door, a metal plate holding a translucent material, both the plate and translucent material having a central circular aperture the diameter of the aperture plate being smaller than the diameter of aperture of the translucent material, a lock cylinder having a cylindrical body portion and a face portion, said face portion

having a larger diameter than the body portion, said aperture in the metal plate will let only said cylindrical body portion through, said face portion being positioned inside said aperature of the translucent material and in contact with said plate, said face portion in contact with said plate holding the metal plate in contact with the door by a "U" shaped tenstion clip placed inside the door, the translucent material being held in place by the metal plate having a metal rim which forms a



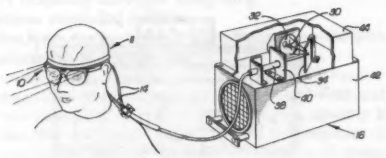
complete frame around the translucent material, at least one recess in the translucent material for accommodating at least one light bulb, both the door and the metal plate have at least one notch which extends outwardly from the aperature in the door and metal plate for accomodate electrical wires connecting a power source to the at least one light bulb and at least one additional notch in the door and the metal plate which accomodates a raised rib on said cylindrical body portion to prevent turning in the aperature.

4,234,910

HEAD-SUPPORTED ILLUMINATION DEVICE

Linda D. Price, 6025 Sea Side Walk, Belmont Shores, Calif. 90803

Filed Mar. 20, 1978, Ser. No. 888,016
Int. Cl.³ F21L 15/14; F21V 7/04
U.S. Cl. 362—105 **23 Claims**



1. A high-intensity, lightweight, head-supported illumination device, comprising:

a light source having a high-intensity lamp and filtering means for removing heat radiation emitted by said lamp, said filtering means including at least one dielectric mirror for separating visible light from infrared radiation;

light collecting means including heat-resistant glass for receiving filtered visible light from said dielectric mirror;

lightweight, plastic fiber-optic light transmitting means adapted for connection to said light collecting means;

head-supported means for securing said light transmitting means to the head; and

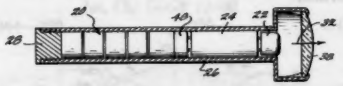
means for terminating said light transmitting means at said head-supported means in such a manner as to project light forwardly of said head-supported means.

4,234,911

OPTICAL FIRING ADAPTOR

Donald L. Faith, 1503 Park Rd., S.E., Atlanta, Ga. 30315

Filed Mar. 13, 1979, Ser. No. 20,958
Int. Cl.³ F41G 1/34
U.S. Cl. 362—111 **12 Claims**



1. An apparatus for insertion in a gun barrel to produce pulses of light simultaing firing of the gun comprising:

means for detecting vibrations produced by the hammer impact resulting from pulling the trigger and producing at least one electrical pulse in response thereto;

a source of electrical energy connected to said detecting and producing means; and

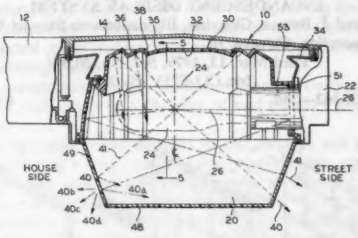
a light source connected to said detecting and producing means for producing said pulses in response to said electrical pulse.

4,234,912

LUMINAIRE FOR RESIDENTIAL ROADWAY LIGHTING

Jocelyn T. Barnes; Chester A. Hard, III, both of Charlevoix, Mich.; Billy L. Shelby, Memphis, and Charles H. Loch, Germantown, both of Tenn., assignors to International Telephone and Telegraph Corporation, Del.

Filed Jun. 28, 1978, Ser. No. 919,938
Int. Cl.² F21S 1/02
U.S. Cl. 362—145 **15 Claims**



1. A luminaire adapted for mounting above a roadway to illuminate the roadway, the luminaire comprising: a high intensity light source, a reflector for developing a plurality of parallel rays of light from the light reflected from said source, said reflector configured to produce a plurality of collimated beams for each opposite direction longitudinally of the roadway above which the luminaire is mounted, and a refractor comprised of repetitive uniform prisms receptive of said collimated beams from said reflector and said source to spread and direct said beams into a pattern of substantially uniform light intensity on the roadway being lighted.

4,234,913

LIGHTED BOBBER FOR A FISHING LINE

Clarence Ramme, 65G, Aurora, Minn. 55705

Filed Feb. 26, 1979, Ser. No. 14,845
Int. Cl.³ F21L 7/00
U.S. Cl. 362—158 **1 Claim**

1. A sealed lighted bobber for a fishing line comprising:

(a) a two piece housing having

(b) a first hollow portion and

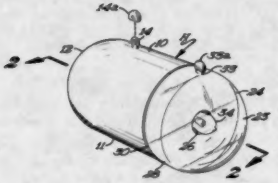
(c) a second hollow portion,

(d) means for removably connecting said first housing por-

tion to said second housing portion in sealing engagement to exclude the atmosphere and render the housing water buoyant,

(e) said second housing portion having a translucent section,

(f) means for mounting a light bulb in said second housing portion including a hollow cylindrical member mounted coaxially within and spaced from said second hollow portion,



(g) means for mounting a battery in said first hollow housing portion to maintain said first hollow housing portion substantially downwardly when the bobber is placed in the water,

(h) means for causing said battery to contact the base of said light bulb for actuation thereof when said first and second housing portions are connected together, and

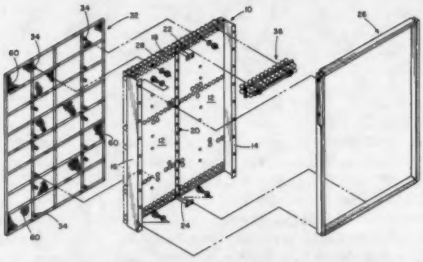
(i) means carried by the housing for connection with a fish line.

4,234,914

INCANDESCENT DISPLAY SYSTEM

Raymond J. Boesen, Glenview, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 13, 1979, Ser. No. 20,077
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—240 **4 Claims**



1. A lamp tray assembly for an incandescent lamp display system including an enclosure having a front panel with a plurality of openings therethrough for the receipt of incandescent lamps said tray assembly comprising:

(a) a chassis having a pluraity of openings therein,

(b) a plurality of lamp sockets, each secured over one of said chassis openings and adapted to receive an incandescent lamp therein, said sockets being smaller in size than the chassis openings so that air may pass through said openings to cool the incandescent lamps,

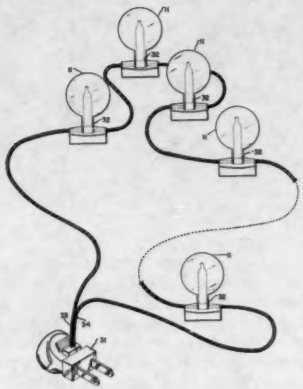
(c) means for releasably securing said tray assembly including said chassis and lamp sockets to said front panel from the rear side thereof during operation of said display system and permitting removal of the tray assembly from said front panel to periodically service the incandescent lamps.

4,234,915

ORNAMENTAL ATTACHMENT FOR DECORATIVE STRING SETS

Richard F. Malinowski, Chesterland, and Thomas F. Harmon, Chagrin Falls, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 9, 1977, Ser. No. 859,057
Int. Cl.³ F21P *1/00*
U.S. Cl. 362—252 **11 Claims**



1. A decorative string set comprising:

a plurality of incandescent lamps permanently attached and secured to a conductor means series connecting said lamps; and

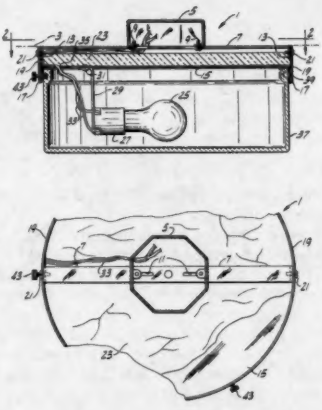
a plurality of decorative means, each secured to and enclosing one of said lamps and a portion of said conductor means and permanently attached and connected thereto, and further securing said lamp to said conductor means.

4,234,916

LIGHTING FIXTURE

Charles D. Goralnik, 200 Brynwych Pl., St. Louis County, Mo. 63141

Filed Aug. 17, 1978, Ser. No. 934,461
Int. Cl.³ F21S *1/02*; F21V *15/00, 21/02, 29/00*
U.S. Cl. 362—294 **14 Claims**



1. A lighting fixture adapted to be mounted on a ceiling by attachment to an outlet box in the ceiling, comprising:

a crossbar adapted to be attached to the bottom of the outlet

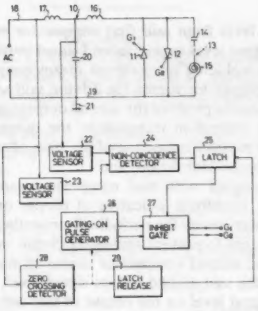
box in position extending horizontally across the bottom of the box, a pan having a relatively thin flat bottom adapted to extend generally horizontally below the crossbar and spaced therefrom, a rim extending upwardly from the bottom of the pan, means for attaching the rim to the crossbar, a lip extending downwardly from the bottom of the pan generally at the periphery thereof, means secured to the bottom of the pan for mounting a light source on the underside of the pan, a diffuser for surrounding said light source, means for fastening the diffuser on the underside of the pan adjacent said lip, the bottom of the pan being substantially continuous and free of any relatively large openings therein, and insulation in the pan above the bottom of the pan and said mounting means for thermally insulating the light source, said mounting means and the pan from the outlet box thereby to reduce the transfer of heat generated by the light source to the outlet box.

4,234,917

COMMUTATION FAILURE DETECTION AND RESTORATION FOR SCR FREQUENCY CONVERTERS

Yoshiaki Suzuki; Junichi Nakakuki; Takumi Mizukawa, and Yoshio Ogino, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 24, 1979, Ser. No. 6,114
Claims priority, application Japan, Jan. 25, 1978, 53-7746
Int. Cl.³ H05B *5/04*
U.S. Cl. 363—160 **7 Claims**



1. A frequency converter comprising:

a silicon controlled rectifier;

a first series resonant circuit operatively connected with said silicon controlled rectifier;

a second series resonant circuit including inductive and capacitive elements operatively connected with said silicon controlled rectifier and tuned to a frequency lower than the resonant frequency of said first resonant circuit and higher than the frequency of a source of energy for generating a reverse voltage across said silicon controlled rectifier upon the occurrence of a commutation failure;

current supplying means having one terminal connected at one end to said silicon controlled rectifier through said inductive element of said second resonant circuit and another terminal connected to said source of energy

control means for providing gating signals to said silicon-controlled rectifier to control the flow of current therethrough; and

means for inhibiting said gating signals upon the occurrence of said reverse voltage to allow said silicon controlled rectifier to restore to its blocking state;

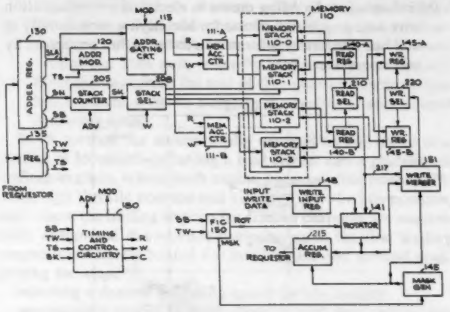
wherein said inhibiting means comprises means for detecting non-coincidence between the polarities of the energy source and the voltage across said capacitive element of said second resonant circuit, and means responsive to said detected non-coincidence to inhibit said gating signals.

4,234,918

TIME-SHARED, MULTI-PHASE MEMORY SYSTEM WITH ERROR CHECKING AND DATA CORRECTING

Ke-Chiang Chu, San Jose, and Richard S. Sharp, Santa Barbara, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 784,352, Apr. 4, 1977, Pat. No. 4,138,720. This application May 31, 1977, Ser. No. 801,869
Int. Cl.³ G0GF *13/00*
U.S. Cl. 364—200 **8 Claims**



1. In a data processing system, the combination comprising:

a memory partitioned into a plurality of individually addressable memory portions, the accessing time of each memory portion requiring at least a plurality of operating cycles of said data processing system;

addressing means coupled to said memory and responsive to an applied address for initiating accessing of selected locations in a plurality of different memory portions over a plurality of consecutively occurring operating cycles in a manner such that the accessing of only a particular selected one of said memory portions is initiated during an operating cycle;

data accumulation means capable of simultaneously storing data read out from a plurality of said memory portions; and

memory output means coupled to said memory and operative during a read operation for receiving data read out from each addressed selected location of a memory portion as it becomes available and operative during each of a plurality of said operating cycles for storing a predetermined portion of the received data from a selected one of said memory portions in a different designated location of said accumulation means until all of the predetermined portions of the received data read out from the addressed selected locations of said memory are simultaneously stored in said accumulation means;

said memory output means including error checking and correcting means for detecting an error in the received data and for correcting at least one predetermined type of error prior to storage of the received data in said accumulation means.

4,234,919

INTERSYSTEM COMMUNICATION LINK

Kenneth E. Bruce, Nashua, N.H.; George J. Barlow, Tewksbury, Mass.; John W. Conway, Waltham, Mass.; Ralph M. Lombardo, Jr., Lowell, Mass.; John J. Bradley, Framingham, Mass., and David B. O'Keefe, Westford, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

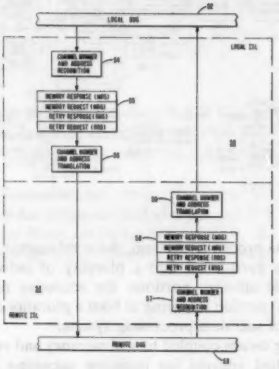
Filed Oct. 31, 1978, Ser. No. 956,385
Int. Cl.³ G06F *3/04*
U.S. Cl. 364—200 **10 Claims**

1. An intersystem communication link for use in a data processing system having plural intersystem communication links for accommodating the transfer of information between

plural communication busses each providing a common information path for data processing devices electrically interfacing therewith, which comprises:

(a) asynchronous information acquisition means for capturing at the bus rate binary information presented on a first one of said communication busses wherein each type of bus communication is stored in a separate one of plural dedicated file locations included in said acquisition means thereby accommodating plural bus communications of different types in parallel;

(b) information decoding means in electrical communication with said acquisition means for identifying substantially at said bus rate binary information to be further processed by said intersystem link;



(c) information translation means in electrical communication with said acquisition means for selectively converting substantially at said bus rate address information presented on said first bus to address information pertaining to a second, remote one of said communication busses, and address information pertaining to said second bus to address information pertaining to said first bus; and

(d) logic control means in electrical communication with said decoding means, said translation means, and said acquisition means and responsive to detection of first control signals on said first bus by said acquisition means for effecting a selective reconfiguration of said intersystem link and further responsive to the detection of second control signals on said first bus by said acquisition means for controlling the transfer of information through said intersystem link to said remote second bus.

4,234,920

POWER FAILURE DETECTION AND RESTART SYSTEM

Bradford O. Van Ness, Paradise Valley, and Dan G. Weimer, Scottsdale, both of Ariz., assignors to Engineered Systems, Inc., Tempe, Ariz.

Filed Nov. 24, 1978, Ser. No. 963,315
Int. Cl.[3] G06F 11/00; G11C 7/02
U.S. Cl. 364—200 **6 Claims**

1. A power failure detection system for use with a computer including in combination:

first means for supplying a voltage to be monitored;

second means for supplying a predetermined reference voltage;

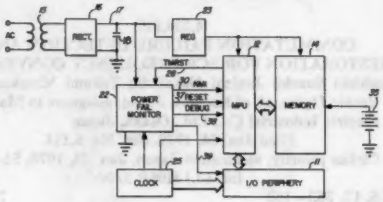
first comparator means having inputs coupled with said first and second means and having an output for supplying a first output signal level when a predetermined normal relationship exists between the voltages supplied by said first and second means and providing a second output signal level when a predetermined abnormal relationship exists between the voltages supplied by said first and second means;

third means for supplying a second predetermined reference voltage;

time delay circuit means;

second comparator means having one input coupled with said third means, having a second input coupled with the output of said first comparator means through said time delay circuit means, and having an output for supplying a first output signal level when the output of said first comparator means is at said first output signal level and for supplying a second output signal level a predetermined time after the signal on the output of said first comparator changes from the first signal level to the second signal level;

computer means connected to the outputs for said first and second comparator means, said computer means interrupting operation in response to the change in the output



signal level from said first comparator means from said first signal level to said second signal level, said computer means including timer circuit means coupled to said second comparator means for driving said second comparator means to produce the second output signal level on the output thereof in response to the output of said timer circuit means irrespective of the state of operation of said first comparator means; and

means coupled with said computer means for receiving signals therefrom indicative of proper operation of said computer means for periodically resetting said timer circuit means to prevent said timer circuit means from driving said second comparator means to the state where it produces said second output signal level, where the second signal level on the output of said second comparator means resets said computer means to a predetermined state of operation.

4,234,921

TESTER FOR ELECTRONIC ENGINE CONTROL SYSTEMS

Tsuneo Kinoshita, Kokubunji; Kazuyuki Sato, Koganei, and Ryusuke Soneoka, Kunitachi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 27, 1978, Ser. No. 919,494
Claims priority, application Japan, Jun. 27, 1977, 52-76381
Int. Cl.[2] G01M 15/00
U.S. Cl. 364—424 **26 Claims**

1. An apparatus for testing an electronic engine control unit wherein the electronic engine control unit receives input signals from a variety of sensors representing the physical conditions of an engine system and wherein the electronic engine control unit generates, in response to the received input signals, response signals to control the operation of the engine system, said testing apparatus comprising:

means for generating signals simulating physical conditions of an engine system;

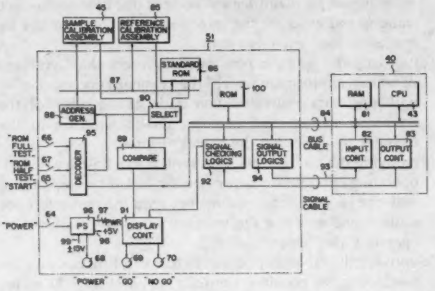
means for selectively supplying said generated signals as said input signals to said electronic engine control unit;

means for receiving said response signals generated by said electronic engine control unit in response to said input signals supplied to said electronic engine control unit;

means for testing whether said received response signals are within predetermined response limits;

means for indicating the results of said testing determination; and

means for controlling said generating means and said supply



means to select the sequence of said simulating signals supplied to said electronic engine control unit and for controlling said receiving means, said testing means and said indicating means to control the indication of the result of the response of said electronic engine control unit to said supplied simulating signals.

4,234,922

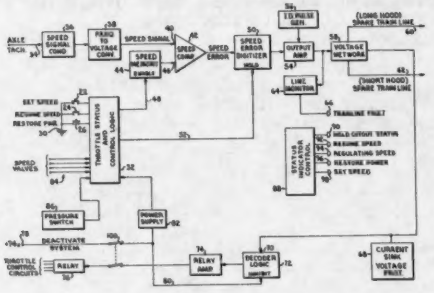
AUTOMATIC LOCOMOTIVE SPEED CONTROL

Calvin D. Wilde, Foster City, and Daniel L. Turner, Belmont, both of Calif., assignors to SAB Harmon Industries, Inc., Grain Valley, Mo.

Filed Mar. 7, 1979, Ser. No. 18,167

Int. Cl.³ G05D *13/62*; G06G *7/66*; B60L *15/32*

U.S. Cl. 364—426 **20 Claims**



1. Apparatus for automatically controlling the speed of a consist of locomotives having a lead engine and a plurality of trailing engines, where each engine has a predetermined, efficient high throttle position and a desired low throttle position, said apparatus comprising:

a plurality of control units including a lead unit for said lead engine and at least a first trail unit and a second trail unit for controlling the throttles of corresponding first and second trailing engines,

an electrical control line extending from said lead unit to said trail units in serial order,

said lead unit having means for sensing the speed of the consist, operator-activated means for selecting a desired operating speed for the consist, and means responsive to activation thereof for generating a cutout control signal and transmitting the same to said trail units along said control line, said control signal having a magnitude that changes in one direction as the actual speed of the consist rises above said desired operating speed, and that changes in the opposite direction as the speed of the consist falls below said desired operating speed,

each of said trail units having a decoder responsive to the magnitude of said control signal for setting the respective engine throttle at either the high position to put the engine on line or the low position to cut it out,

said trail units being provided with means responsive to said control signal for changing the magnitude thereof in said one direction by an amount equal to a predetermined speed increase as said control signal is conducted rearwardly in the consist from each trail unit to the next succeeding trail unit, whereby engines are successively throttled back from the rear of the consist and returned on line from the front to maintain the consist at said desired operating speed.

16. A method for automatically controlling the speed of a consist of locomotives having a lead engine and a plurality of trailing engines, where each engine has a predetermined, efficient high throttle position and a desired low throttle position, and where the trailing engines for control purposes are numerically designated in sequence beginning with the first trailing engine immediately behind the lead engine, said method comprising the steps of:

selecting a desired operating speed for the consist;

generating a cutout control signal in said lead engine and transmitting the control signal to the trailing engines in serial order;

providing said control signal with a characteristic that changes as the actual speed of the consist rises above and falls below said desired operating speed;

modifying said characteristic of the control signal as it is transmitted from the first trailing engine to successive trailing engines, in a manner such that the control signal at each trailing engine in succession represents a predetermined speed increase; and

decoding said control signal at each trailing engine and setting the throttle thereof at either the high position to put the engine on line or the low position to cut it out, whereby engines are successively throttled back from the rear of the consist and returned on line from the front to maintain the consist at said desired operating speed.

4,234,923

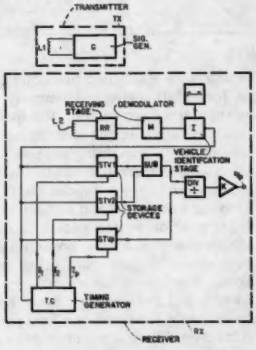
VEHICLE DETECTION SYSTEMS

Kamran Eshraghian, Hectorville, and Robert E. Bogner, College Park, both of Australia, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 22, 1978, Ser. No. 902,929

Int. Cl.³ G06G *7/76*

U.S. Cl. 364—436 **4 Claims**



1. A vehicle detection system comprising a transmitter for

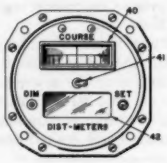
supplying a continuous wave signal, a receiver and sensing means for coupling said continuous wave signal to said receiver so that the approach of a vehicle produces a disturbance having a leading edge with a changing voltage level in the envelope of the signal received by said receiver, said receiver including first means for deriving from said received signal a first signal representative of the envelope voltage at a first instant during the leading edge portion of said disturbance at which the slope of the leading edge first starts to markedly decrease less a voltage corresponding approximately to the envelope voltage prior to said disturbance produced by the approach of a vehicle, second means for deriving from said received signal a second signal representative of the envelope voltage of the received signal at a second instant at which the slope of the leading edge is substantially at its maximum, third means for deriving from said received signal a third signal representative of the envelope voltage of the received signal at a third instant occurring at a fixed time period subsequent to said second instant and prior to said first instant, means for producing from said third and second signals a fourth signal representative of the difference between the envelope voltages at said third and second instants and means for dividing said fourth signal by said first signal to obtain an output signal indicative of the velocity of the vehicle.

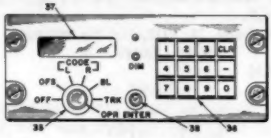
4,234,924

METHOD OF INTRODUCING A BASELINE MEASUREMENT INTO ELECTRONIC POSITIONING APPARATUS

Cecil N. La Vance, Paradise Valley, and Allan A. Beale, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 11, 1978, Ser. No. 940,913
Int. Cl.³ G06F *15/50*; G01S *5/14, 13/08*
U.S. Cl. 364—460 **3 Claims**





2. In conjuction with electronic positioning apparatus, including means for substantially continuously measuring the distance of the apparatus from each of two spaced apart reference stations each having a unique identification code and for substantially continuously computing the position of the apparatus relative to the two reference stations with the use of a known baseline between the two stations and further including a control unit having a keyboard and an "enter" switch combination, a multiple position switch and an associated memory for storing information used by the positioning apparatus for computing the position, the keyboard being operatively connected to different portions of the memory by different positions of the switch and the memory being operatively connected to the positioning apparatus in a final position for use of the stored information during computations, a method of setting up an operation comprising the steps of:

(a) moving the multiple position switch to a first position, operating appropriate keys of the keyboard corresponding with a desired amount of offset between adjacent parallel paths and entering the information in the memory by operating the "enter" switch;

(b) moving the multiple position switch to a second position, operating appropriate keys of the keyboard corresponding with the unique identification code of one of the reference stations and entering the information in the memory by operating the "enter" switch;

(c) moving the multiple position switch to a third position, operating appropriate keys of the keyboard corresponding with the unique identification code of the other of the reference stations and entering the information in the memory by operating the "enter" switch;

(d) moving the multiple position switch to a fourth position, operating appropriate keys of the keyboard corresponding with the length of the baseline between the two reference stations and entering the information in the memory by operating the "enter" switch;

(e) moving the multiple position switch to a fifth position for connecting the position computing apparatus to the memory through the "enter" switch, positioning the apparatus over a first point on a first path and operating the "enter" switch to enter the position information in the memory, and moving the apparatus along the first path to a second point on the first path spaced from the first point and operating the "enter" switch to enter the position information in the memory; and

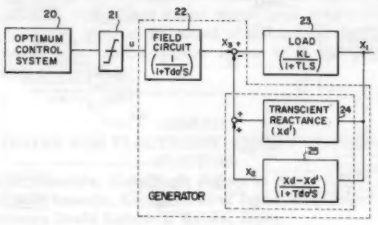
(f) moving the multiple position switch to the final position.

4,234,925

CONTROL SYSTEMS FOR GENERATORS

Yuichi Kitano, Kawagoe, and Kaiichirou Hirayama, Tokorozawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 626,103, Oct. 28, 1975, abandoned.
This application Dec. 29, 1977, Ser. No. 865,419
Claims priority, application Japan, Oct. 29, 1974, 49-123978
Int. Cl.² G21C *7/00*
U.S. Cl. 364—494 **3 Claims**



1. A control system for a generator comprising:

a generator having a field winding,

a digital computer, said digital computer including memory means for storing a predetermined optimum pattern of the field excitation of said generator,

a digital analogue converter for converting the digital signal produced by said digital computer into an analogue signal for controlling the excitation of said field winding,

a load energized by said generator, said load comprising a plasma device including a field coil requiring an excitation current having a rectangular waveform, and

means responsive to said optimum pattern for causing said computer to generate an optimum control signal required by the characteristics of said load, thereby controlling the field excitation of said generator in accordance with said optimum control signal.

4,234,926

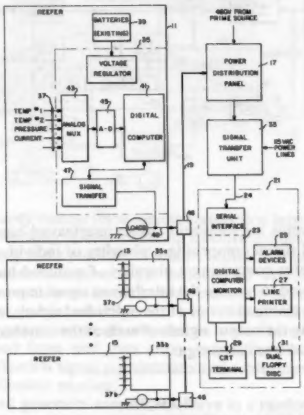
SYSTEM & METHOD FOR MONITORING & DIAGNOSING FAULTS IN ENVIRONMENTALLY CONTROLLED CONTAINERS, SUCH SYSTEM AND METHOD BEING ESPECIALLY ADAPTED FOR REMOTE COMPUTER CONTROLLED MONITORING OF NUMEROUS TRANSPORTABLE CONTAINERS OVER EXISTING ON-SITE POWER WIRING

Clifford G. Wallace, Alameda, Calif.; Carl von Isenburg, Westfield; Michael D. Chun, Bud Lane, both of N.J.; Kenneth G. Holmberg, Oakland, and Robert T. Bryant, San Leandro, both of Calif., assignors to Sealand Service Inc., Edison, N.J.

Filed Dec. 5, 1978, Ser. No. 966,785

Int. Cl.[3] G06F *15/46*

U.S. Cl. 364—551 64 Claims



1. A system for monitoring the condition of a controlled area over existing on-site wiring, said system comprising

sensor means disposed for detecting predetermined parameters representative of the condition of said controlled area.

a data acquisition unit located proximate said controlled area, said data acquisition unit comprising electronic means forming a first digital computer having input/output interface means including serial input/output interface means, and further comprising means for inputting to said first digital computer container parameter data generated by said sensor means, and a first bidirectional data transfer means for transferring serial digital data between said first digital computer and on-site power wiring,

a second digital computer and input/output means therefore, said second digital computer and input/output means being suitably located to provide for the remote monitoring of said controlled area, and

a second bidirectional data transfer means for transferring serial digital data between said second digital computer and said on-site wiring whereby a serial digital data stream can be transmitted in either direction between the monitoring second digital computer and the first digital computer of the data acquisition units.

4,234,927

MICRO PROCESSOR CONTROLLED SENSOR SYSTEM FOR APARTMENT HOUSE

Theodore C. First, R.D. #1, Furnace, Pa. 16865

Filed May 8, 1978, Ser. No. 904,173

Int. Cl.[2] G06F *15/20;* F28F *27/00*

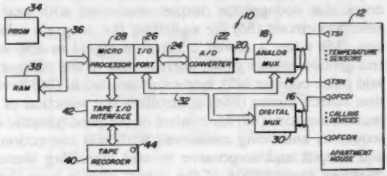
U.S. Cl. 364—557 5 Claims

5. A method of collecting energy information for an apartment house having plural apartments, a furnace for heating said apartments and plural calling devices located in said apartments for operating said furnace, comprising:

sensing the temperatures of said apartments and generating a set of apartment temperature signals representative thereof,

sensing the states of said plural calling devices to determine whether said furnace is being operated by said calling devices,

repeating said temperature sensing and state sensing steps at preselected intervals of time,



accumulating for each apartment said apartment temperature signals, and

counting for each apartment the number of times that a calling devices located at that apartment operates said furnace.

4,234,928

X-RAY DIAGNOSTIC INSTALLATION FOR X-RAY PHOTOGRAPHS

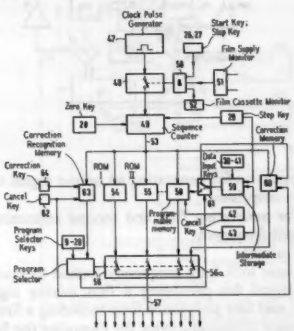
Rolf Pfeifer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,399

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1978, 2808288

Int. Cl.[3] G11C *11/42*

U.S. Cl. 364—571 4 Claims



1. Program control apparatus for the photographic operating sequence of an x-ray photographic installation comprising a series of memory circuits for storing respective photographic program sequences, a resettable pulse counter being connected with the address input of each of said memory circuits for sequentially selecting the program steps of the respective memory circuits, a pulse generator for supplying program signals to the pulse counter for sequentially selecting the program steps of the respective memory circuits, and a program selection circuit connected with the outputs of the memory circuits for transmitting the output signals from a selected one of the memory circuits, wherein the improvement comprises a correction memory (60) for selectively storing respective corrected photographic program steps representing corrections for selected program steps of said memory circuits, said correction memory (60) having an address input connected with said resettable pulse counter (49) for enabling the selection of the corrected

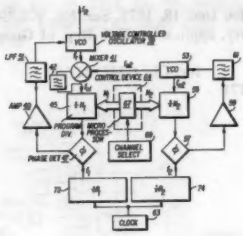
photographic program step corresponding to the count of said pulse counter (49), and having an output connected with said program selection circuit (56) for supplying such corrected photographic program step thereto, a correction recognition memory (63) having an address input connected with said resettable pulse counter (49) and operable for storing correction signals for identifying the counts of said pulse counter (49) for which the respective corrected photographic program steps are stored in said correction memory (60) and having a correction recognition output connected with said program selection circuit (56) for signalling the program selection circuit (56) when a stored correction signal in said correction recognition memory (63) corresponds to the current count of said pulse counter (49), said selection circuit (56) having selection switch means (56a) controlling the selection of said correction memory (60) for control of the photographic operating sequence, and being connected with said correction recognition output and responsive to said signalling therefrom for disabling transmission of the output signals from the selected one of the memory circuits and for effecting in place thereof the transmission of the corresponding corrected photographic program step from said correction memory (60).

4,234,929

CONTROL DEVICE FOR A PHASE LOCK LOOP VERNIER FREQUENCY SYNTHESIZER

William J. Riley, Jr., Rochester, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 24, 1979, Ser. No. 78,210
Int. Cl.³ G06F *7/68*
U.S. Cl. 364—701 **14 Claims**



1. An apparatus for generating an output signal of a selected frequency comprising:

means for generating first and second reference signals of different frequency;

a signal mixer;

a first phase lock loop frequency locked to said first reference signal for providing a first mixing signal to said mixer, said first phase lock loop including a first adjustable frequency changing device for changing the frequency of a signal within said first loop by an adjustable factor of N_1;

a second phase lock loop frequency locked to said second reference signal for providing a second mixing signal to said mixer, said second phase lock loop including a second adjustable frequency changing device for changing the frequency of a signal within said second loop by an adjustable factor of N_2, said first and second phase lock loops controlling said mixer to provide an output signal having a frequency which is determined by said N_1 and N_2 factors;

means for selecting a desired frequency for said output signal; and,

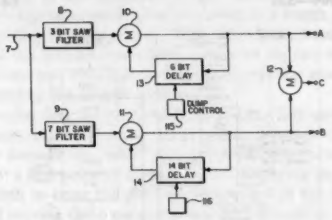
a microprocessor responsive to said desired frequency selection means for determining N_1 and N_2 factors which will produce said desired frequency and for respectively applying determined N_1 and N_2 factors to said first and second frequency changing devices, said microprocessor preventing application of predetermined ones of the N_1 and N_2 factors, which could produce a selected desired frequency, to said first and second frequency changing devices.

4,234,930

INTERLEAVED BINARY CODED SIGNAL TRANSLATION DEVICE

Russell Campbell, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Jul. 28, 1978, Ser. No. 928,972
Claims priority, application Canada, Apr. 25, 1978, 301883
Int. Cl.³ G06F *15/31*; H04B *1/12*
U.S. Cl. 364—724 **13 Claims**



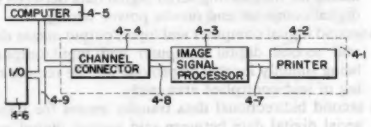
1. Apparatus for translation of an interleaved binary coded signal, said signal comprising a plurality of individual signals, said apparatus comprising a plurality of matched binary code filters adapted to receive the interleaved signal in parallel, each filter being matched to one of the individual signals, and means for summing the output signals of each of the matched filters to produce said translated signal.

4,234,931

INFORMATION OUTPUT APPARATUS FOR PUTTING OUT A CHARACTER DOT PATTERN

Kiyoshi Kanaiwa, Kawasaki, and Kozo Matsumoto, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1978, Ser. No. 933,048
Claims priority, application Japan, Aug. 11, 1977, 52/96441; Nov. 11, 1977, 52/135482; Nov. 15, 1977, 52/136920; Nov. 17, 1977, 52/138205
Int. Cl.³ G06F *3/14*; H04L *17/16*; B41B *15/00*
U.S. Cl. 364—900 **20 Claims**



1. An information output apparatus comprising:

dot pattern store means storing a plurality of sets of character dot patterns for displaying characters;

position store means storing position signals representing the stored positions of the respective dot patterns stored in said dot pattern store means;

signal forming means responsive to character code signals designating the character dot patterns to be put out for forming read-out signals for reading out from said position store means the position signals;

read-out means for applying the position signal read out from said position store means by the read-out signal from said signal forming means to said dot pattern store means to read out from said dot pattern store means the character dot pattern stored in the position associated with the applied position signal; and

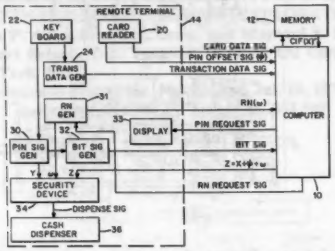
output means for putting out as visible information the character dot pattern read out from said dot pattern store means by said read-out means.

4,234,932

SECURITY SYSTEM FOR REMOTE CASH DISPENSERS

Richard A. Gorgens, Bedford, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 5, 1978, Ser. No. 939,504
Int. Cl.[3] G06F *15/30*
U.S. Cl. 364—900 **6 Claims**



1. A security system for a remote transaction terminal of an automated banking system including a central computer with a main memory and a plurality of remote transaction terminals in electrical communication with said central computer, said remote transaction terminal having customer operated data entry means and a cash dispenser, which comprises:

(a) first generator means responsive to an electrical signal received from said data entry means for providing an identification signal representative of a customer personal identification number;

(b) second generator means responsive to a random number request signal received from said central computer for supplying a pseudo random number signal to said central computer; and

(c) comparator means in electrical communication with said first generator means and said second generator means by way of signal paths wholly contained within said remote transaction terminal, and in electrical communication with said central computer for issuing a cash dispense signal to said cash dispenser when a composite signal received from said central computer bears a predetermined relationship with said identification signal received from said first generator means and said random number signal received from said second generator means, said composite signal being formed by said central computer from a customer record signal stored in said main memory, from an offset signal supplied by said data entry means and bearing a predetermined relationship between said identification signal and said customer record signal, and from said random number signal.

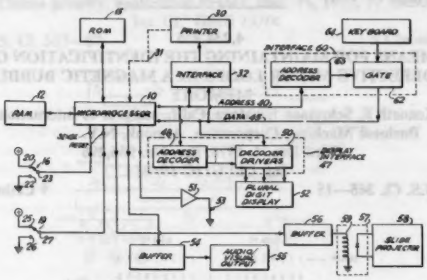
4,234,933

ELECTRICAL GAME, POLLING AND TESTING APPARATUS

Alexander M. Adelson, Peekskill; Stephen C. Gulick, Flushing, both of N.Y., and Arnold L. Grubin, Teaneck, N.J., assignors to Dimensional Communications, Inc., Northvale, N.J.

Filed Sep. 13, 1978, Ser. No. 941,934
Int. Cl.[3] G06F *3/14*
U.S. Cl. 364—900 **10 Claims**

1. In combination, a microprocessor; a read only memory, a variable content memory, an address bus, and a data bus connected to said microprocessor; visual image forming means including means for displaying a sequence of images, and display control means for advancing the image then formed by said image forming means; said image forming means comprising a slide projector containing plural projectable slides, and wherein said display control means comprises a projector-controlling switch to advance the slide then being projected by said slide projector; means controlled by said microprocessor for selectively actuating said display control means; data input means, and interface means connected to said address bus and



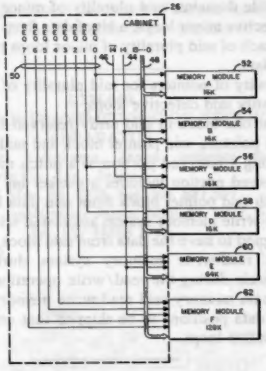
said data bus for selectively connecting said data input means to said data bus; said variable content memory including plural answer data storage means in one-to-one correspondence with at least a subset of said images; and means for loading said answer data storage means employing said data input means.

4,234,934

APPARATUS FOR SCALING MEMORY ADDRESSES

Lee T. Thorsrud, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 964,994
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—900 **5 Claims**



1. A data processing apparatus comprising:

a memory module wherein said memory module has a storage capacity depending upon a variable number of memory banks contained within said memory module;

a requestor which generates a memory address to be used by said memory module wherein said memory address consists of a plurality of bits;

determining means responsively coupled to said memory module for determining said variable number of memory banks contained within said memory module;

stripping means responsively coupled to said requestor and said determining means for stripping from said memory address a one or more of said plurality of bits thereby producing a modified memory address wherein said modified memory address consists of a minimum number of bits sufficient to address said storage capacity of said memory

module depending upon said variable number of memory banks as determined by said determining means; and

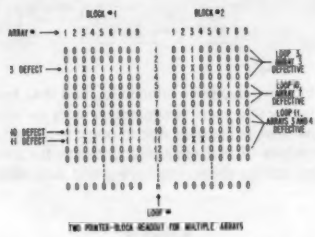
means responsively coupled to said memory module and said stripping means for transferrng said modified memory address from said stripping means to said memory module.

4,234,935

MEANS FOR MAINTAINING THE IDENTIFICATION OF DEFECTIVE MINOR LOOPS IN A MAGNETIC BUBBLE MEMORY

Kenneth E. Schreiner, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,298
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—15 **9 Claims**


BLOCK #1
BLOCK #2
ARRAY # → 1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9
3 DEFECT →
LOOP 3 ARRAY 3 DEFECTIVE
LOOP #5 ARRAY 5 DEFECTIVE
LOOP 11 ARRAYS 3 AND 4 DEFECTIVE
10 DEFECT →
11 DEFECT →
LOOP #
TWO PRINTER-BLOCK READOUT FOR MULTIPLE ARRAYS

1. A bubble domain memory system having a major/minor loop array suitable for the storage and guided movement of bubble domains, the system comprising:

a plurality of minor loops in said array adapted for the storage of bits of data encoded as the presence or absence of bubble domains, said plurality of minor loops containing defective minor loops, a bit of data from the same position in each of said plurality of minor loops represents a block of data,

a plurality of pointers for said plurality of minor loops that identify said defective loops,

at least one block in said array reserved for the storage of said pointers, said pointer block and said data blocks containing a reserved portion as a notch means wherein the reserved portion includes a marker bit pattern to distinguish said pointer block from said data blocks, and

a read-write memory system associated with said block and adapted to have the data from said block communicaed to said read-write memory system during initialization wherein during the read/write operations of said bubble domain memory said read-write memory system enables the data positions to be skipped that correspond to said defective loops.

4,234,936

POWER SEAT MEMORY

Burton L. Siegal, 7605 N. Tripp St., Skokie, Ill. 60076

Filed May 4, 1979, Ser. No. 36,006
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—244 **9 Claims**

1. In an electro-mechanical memory-positioning system comprising:

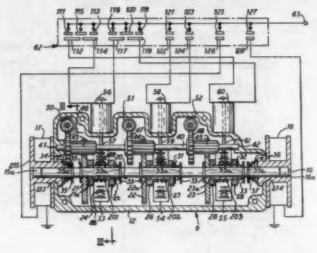
an electrically energizable drive means mechanically connectable to a positionable device to move the device to a pre-determined position when the device is displaced therefrom;

at least one pair of cams connected to said drive means movable in response to movement of the positionable device, said cams mounted on a shaft side by side for rotation about their axes and for selective movement longitudinal of their axes;

at least a pair of cam followers mounted between each said pair of cams;

a pair of switch means mechanically mounted on said cam followers for movement therewith, said switch means including contacts to electrically connect said drive means to a power supply; and

means for moving each said pair of cams longitudinally of their axis such that when moved in a first direction one of said cams engages one of said cam followers to cause said drive means to move said positionable device in a first



direction to a first pre-determined position or said cam engages the other switch actuator to cause said drive means to move said positionable device in a second direction to said first pre-determined position; the improvement of:

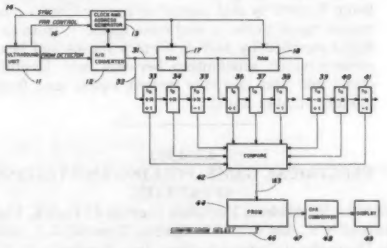
at least one solenoid having a manually operable switch for selective energizing of said solenoid, having an actuator mechanically connected to said switch means to move said switch means upon energizing of said solenoid to open and close said switch means.

4,234,937

PEAK DETECTOR FOR RESOLUTION ENHANCEMENT OF ULTRASONIC VISUALIZATION SYSTEMS

Reginald C. Eggleton, Indianapolis, Ind., and Warren L. Williamson, Mesa, Ariz., assignors to Indianapolis Center For Advanced Research, Indianapolis, Ind.

Continuation-in-part of Ser. No. 878,126, Feb. 13, 1978, abandoned, which is a continuation of Ser. No. 711,359, Aug. 3, 1976, Pat. No. 4,074,223. This application Feb. 12, 1979, Ser. No. 11,303
Int. Cl.³ G01S *15/00*
U.S. Cl. 367—11 **9 Claims**



1. A peak detector system for ultrasonic visualization arrangements comprising:

(a) first means for dividing received ultrasonic energy into resolution elements;

(b) second means for creating for each resolution element a plural-bit word which encodes the value of the received ultrasonic energy in the resolution element;

(c) third means for storing said plural-bit words;

(d) fourth means connected to said third means for compar-

ing said plural-bit words and producing at its output a signal indicative of peak points determined by said fourth means for comparing;

(e) fifth means for selecting a transfer function from a plurality of transfer functions for performing a value conversion of the output of said fourth means; and

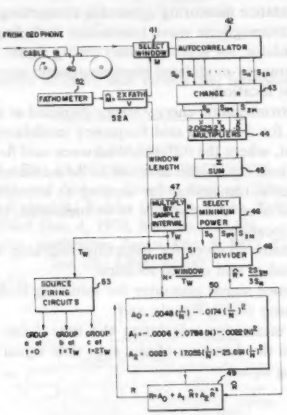
(f) said fifth means including a PROM having a first series of address inputs coupled to said fourth means and a second series of address inputs for receiving a plural-bit word.

4,234,938

DETERMINATION OF REFLECTIVITY AND WATER DEPTH FOR MARINE SEISMIC EXPLORATION

Kenneth P. Allen, Stamford, Conn., and Maynard S. Redeker, Farmers Branch, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 709,484, Jul. 28, 1976. This application Oct. 25, 1977, Ser. No. 844,549
Int. Cl.[3] G01V *1/38*
U.S. Cl. 367—24 **7 Claims**



1. In marine seismic exploration which includes:

firing at least one source in an array of sources towed by a marine vessel,

recording seismograms representing the reflected seismic pulses,

measuring the water bottom reflectivity and the water depth from the recorded seismograms,

converting the measurements of reflectivity and water depth into a time domain operator representative of the inverse of the reverberaion distortion in the water layer between the water bottom and water surface, and

thereafter firing said array of sources in groups such that the acoustic pulses from each of said sources combine to produce a resultant acoustic pressure wave having said time domain operator characteristic in its travel to and from the subsurface formation,

the improvement wherein said measuring comprises the steps of:

generating the zero lag auto-correlation coefficients of a window of said seismogram,

generating the auto-correlation coefficients of said window with a lag of n time samples,

generating the auto-correlation coefficients of said window with a lag of 2n time samples,

repeating the foregoing for various values of n,

combining the auto-correlation coefficients generated for each value of n, and

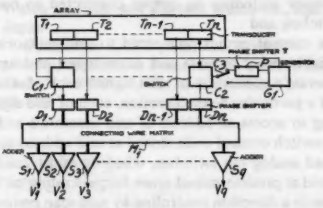
selecting the n producing the minimum in the combined auto-correlation functions as being representative of water depth.

4,234,939

ARRAY SYSTEM WITH A HIGH RESOLVING POWER

Georges Grall, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 12, 1978, Ser. No. 968,815
Claims priority, application France, Dec. 16, 1977, 77 38092
Int. Cl.[3] G01S *15/06*
U.S. Cl. 367—87 **5 Claims**



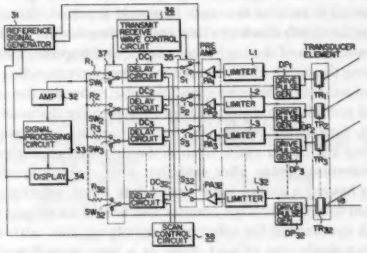
1. An array system for the detection of targets in a wave system, in particular sonar with a high resolving power, comprising: an array of transmitting transducers and an array of receiving transducers, each array having substantially the same length L, said receiving array comprising a plurality of transducers distributed over said length L, phasing means connected to said transducers for pre-forming q channels in q directions, each of said channels having a reception pattern directed at one of said q directions, said transmitting array comprising first and second transmitting transducers connected to a generator said first and second transmitting transducers being placed at the extremities of the transmitting array, the radiation pattern of said transmitting array having a series of maxima and minima and the transmission-reception assembly having an overall pattern with an angular width at 3 dB that is less than $0.64\ \lambda/L$, wherein λ is the wavelength in the medium of propagation and the centre of the pre-formed channels corresponds to the directions of the maxima of transmission.

4,234,940

ULTRASOUND TRANSMITTING OR RECEIVING APPARATUS

Kazuhiro Iinuma, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Mar. 16, 1978, Ser. No. 887,337
Claims priority, application Japan, Mar. 16, 1977, 52-28016
Int. Cl.[2] G01S *9/66*
U.S. Cl. 367—105 **17 Claims**



1. A beam steering system for an ultrasonic diagnostic apparatus comprising, in combination:

a plurality of ultrasound transducers for generating an ultrasonic beam;

pulse generating means for energizing said transducers to emit a sequence of pulses of ultrasonic energy;

a plurality of variable delay circuits for coupling said pulse

generating means to each of said transducers, each said variable delay circuit including a tapped analog delay line having an input connected to receive the output of said pulse generating means and a plurality of output taps, said circuit further including an analog switch connected to each said tap and to a common output coupled to one of said transducers and a memory storing switch control codes representing states of said analog tap switches, said memory including an output connected to control said switches; and

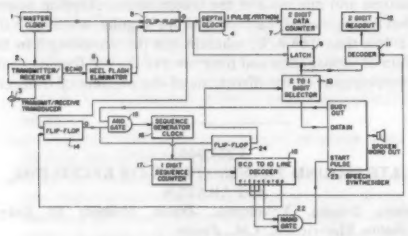
a scan control circuit connected to said memories of said variable delay circuits and constructed and arranged to generate a succession of scan signals each of which represent a particular beam direction, each of said signals operating to access an address of said memories and to apply the switch control code stored at said address to the associated analog tap switches, whereby said transducers are pulsed at predetermined times for generating an ultrasonic beam in a direction controlled by said scan control circuit.

4,234,941

VERBAL READ-OUT DEPTH SOUNDING SYSTEM

Frederick J. Welland, Jr., Namu, and Edward C. Cairns, Richmond, both of Canada, assignors to Coast Radar and Communications Ltd., Namu, Canada

Filed Sep. 25, 1978, Ser. No. 945,381
Claims priority, application Canada, May 25, 1978, 304241
Int. Cl.³ G01S *15/14*
U.S. Cl. 367—116 **8 Claims**



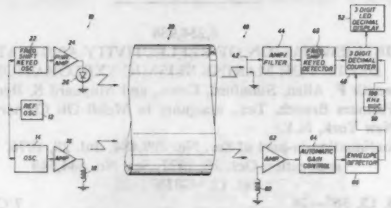
1. A system for measuring distance to an object comprising means both for transmitting a high frequency sound impulse and for receiving a high frequency echo sound impulse reflected from the object, a depth clock, a multidigit counter connected to receive an output from said depth clock, means to initiate the depth clock at a first time corresponding to the time of transmission of the high frequency sound impulse, means for stopping the depth clock at a second time corresponding to the time of receipt of the echo sound impulse, whereby the content of said multidigit counter is proportional to the distance to the object, time delay means coupled to prevent said means for stopping the depth clock from actuation until expiration of a predetermined delay after said first time, speech synthesizer means having a gating input and a data input, selector means coupled to said multidigit counter and to said data input of said speech synthesizer for selectively supplying data corresponding to a single one of said digits at a time in said multidigit counter, and sequence clock means operable when the depth clock is stopped to drive a sequence generator which provides sequential pulses to different outputs, and includes a plurality of outputs coupled to said gating input of said synthesizer, and an output therebetween coupled to said selector means for sequentially stepping said selector means to couple a different digit in said multidigit counter to said data input of said synthesizer.

4,234,942

APPARATUS FOR MEASURING THE LENGTH OF PIPE AND OTHER HOLLOW MEMBERS

Benjamin G. Prause, Tomball, and John D. Meyers, Plano, both of Tex., assignors to D & W International, Inc., Lafayette, La.

Filed Jul. 24, 1978, Ser. No. 927,463
Int. Cl.³ G01S *11/00*
U.S. Cl. 367—128 **14 Claims**



1. A distance measuring apparatus comprising:

an electromagnetic wave transmitter including a frequency modulator, for sending a start timing signal in the form of a frequency modulated electromagnetic wave, disposed at a first location;

an electromagnetic energy sensor disposed at a second location, for detecting said frequency modulated start timing signal, where the difference between said first and second locations equals the distance to be measured;

an acoustic transmitter for sending an acoustic stop timing signal over said distance to be measured, located at said first location;

an acoustic receiver for detecting said stop timing signal, located at said second location;

a reference signal generator for initiating both of said start and stop timing signals; and

circuit means for calculating the time delay response between the detection of said start time signal and said stop timing signal.

4,234,943

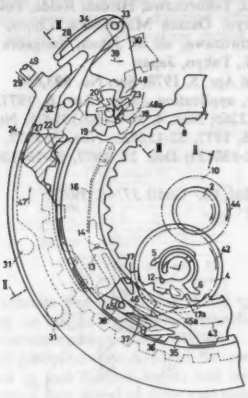
MONTH CORRECTING MECHANISM FOR CALENDAR TIMEPIECES

Kazuo Teramoto, Fuchu; Minoru Watanabe, Tokorozawa, and Tetuo Matumura, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1978, Ser. No. 963,173
Claims priority, application Japan, Nov. 26, 1977, 52-141883
Int. Cl.³ G04B *27/08*
U.S. Cl. 368—35 **12 Claims**

1. A month correcting mechanism for calendar timepieces comprising a date dial having a toothing: a month dial having a toothing, a driving member adapted to engage the toothing of said date dial for driving it one step every 24 hours, a month dial driving device for driving said month dial one step during the rotation of said date dial between the date indications "31"

and "1", and a month correcting lever assembly provided to engage with said toothing of said month dial and adapted to be



manually actuated to drive said month dial independently of said date dial.

4,234,944

ALARM ELECTRONIC TIMEPIECE

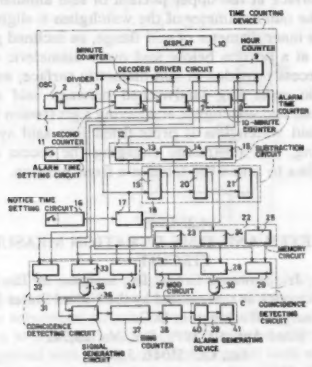
Shojiro Komaki, and Noboru Kaneko, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Dec. 4, 1978, Ser. No. 966,271

Claims priority, application Japan, Dec. 8, 1977, 52-147519

Int. Cl.³ G04C *21/00*

U.S. Cl. 368—72 **4 Claims**



1. In an alarm electronic timepiece comprising an oscillating circuit for generating a high frequency reference signal, a frequency dividing circuit for dividing the reference signal into a low frequency time signal, a display device for displaying the present time in accordance with the time signal, an alarm counter for presetting a desired alarm time, a coincidence detecting circuit for detecting coincidence between a signal representative of the preset alarm time and a signal representative of present time and for generating an output signal when coincidence is detected, and a buzzer for generating an alarm sound in response to the output signal, the improvement comprising: means for generating the alarm sound at a time before the preset alarm time and at a sound volume which varies with the passage of time, said means including a subtraction circuit connected between said alarm counter and said coincidence detecting circuit, a ring counter connected to receive the output signal from said coincidence detecting circuit, and a modulation circuit connected to said ring counter for modulating the signal applied to said buzzer.

4,234,945

ELECTRONIC TIMEPIECE WITH HOURLY STRIKE MECHANISM

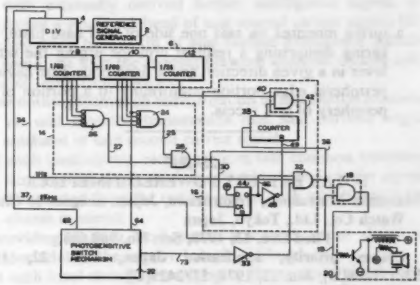
Yasushi Nomura; Yuzo Komatsu, both of Tokorozawa, and Shigeru Morokawa, Higashiyamato, all of Japan, assignors to Citizen Watch Co., Ltd. and Rhythm Watch Co., Ltd., both of Tokyo, Japan

Filed Mar. 6, 1978, Ser. No. 883,897

Claims priority, application Japan, Mar. 7, 1977, 52/23883

Int. Cl.³ G04B *21/00, 21/02;* **G08B** *3/00*

U.S. Cl. 368—75 **7 Claims**



1. An electronic timepiece comprising:

(a) a timepiece mechanism comprising a time reference signal generator, a frequency divider connected to said generator, a time keep mechanism connected to said divider, and a display device connected to said time keep mechanism;

(b) an acoustic information mechanism comprising an hour information time detection means receiving an output from said time keep mechanism, an acoustic hour information control means, and an alarm mechanism receiving an output of said acoustic hour information control means and emitting an alarm in response thereto; and

(c) a photosensitive switch mechanism controlling said acoustic information mechanism, said photosensitive switch mechanism comprising an intermittent switch means and a memory means each connected to said timepiece mechanism, and a photosensitive element controlled intermittently by said intermittent switch means whereby the amount of light intermittently received by said photosensitive element is memorized by said memory means so that said acoustic information mechanism may be controlled in response to the memorized contents in said memory means.

4,234,946

ELECTRONIC WRISTWATCHES

Kotaro Takahashi, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 970,905

Claims priority, application Japan, Dec. 22, 1977, 52/171906[U]

Int. Cl.³ G04B *19/24, 27/00*

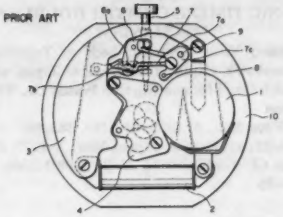
U.S. Cl. 368—76 **6 Claims**

1. In a watch movement construction for an electronic wristwatch powered by a battery and having time indicating hands, the improvement comprising:

a base plate having a radial bore, and a recess formed on one side of said base plate to accommodate said battery;

a time adjustment shaft movable in said radial bore of said base plate to predetermined locations for correcting said time indicating hands;

a setting lever pivotally mounted on said one side of said base plate and cooperating with said time adjustment shaft; and



a spring mounted on said one side of said base plate, said spring comprising a resilient arm for urging the setting lever in a given direction and a fixed body part having a peripheral edge portion conforming to a portion of the periphery of said recess.

4,234,947

SOLAR BATTERY POWERED TIMEPIECE

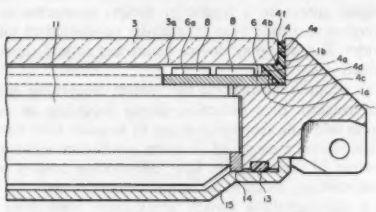
Masataka Matsumoto, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1978, Ser. No. 968,688

Claims priority, application Japan, Dec. 22, 1977, 52/171788[U]; Jan. 12, 1978, 53/2429[U]

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—287 **9 Claims**



1. An electronic timepiece having an electro-optical display cell, comprising:

a watch case including an recess in one side thereof, said recess having a radially extending bottom surface formed at a lower portion of said recess and a radially facing peripheral wall;

a base plate mounted on the bottom surface of said recess, said base plate supporting at least one solar battery and having a recess at a central portion thereof to accommodate therein said display cell and having a peripheral side wall;

a watch glass positioned in said recess above said base plate and having a bottom wall and a peripheral wall; and

resilient packing means including an axially outwardly extending annular wall portion compressed between the peripheral wall of said watch glass and the radially facing peripheral wall of said watch case, a radially inwardly extending annular wall portion compressed between the bottom wall of said watch glass and said base plate to resiliently retain said base plate to alleviate external shocks being applied to said base plate in an axial direction, and an axially inwardly extending annular wall portion compressed between the peripheral wall of said base plate and the peripheral of said watch case to resiliently retain said base plate to alleviate the external shocks being applied to said base plate in its radial direction.

4,234,948

WATCHGLASS FIXING STRUCTURE

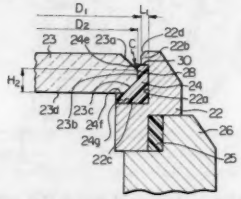
Yasuo Maekawa; Tsunetoshi Sekiguchi, both of Tokyo; Masahiko Waki, Tokorozawa; Hiroshi Koide, Tokyo; Kisuke Watanabe, Tokyo; Osamu Matsumura, Chofu, and Hisao Yamagata, Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1978, Ser. No. 893,686

Claims priority, application Japan, Apr. 6, 1977, 52-39353; Jul. 9, 1977, 52-82265; Nov. 4, 1977, 52-131475; Nov. 4, 1977, 52-131476; Nov. 5, 1977, 52-132825; Nov. 7, 1977, 52-133280; Nov. 17, 1977, 52-138131; Dec. 23, 1977, 52-155136; Dec. 27, 1977, 52-156440

Int. Cl.³ G04B *37/08, 39/02*

U.S. Cl. 368—291 **9 Claims**



1. A structure for fixing a watchglass of a watch case, comprising:

a watchglass fixing member having an annular recess, a flange formed at an upper portion of said recess and having an inner diameter, and a watchglass seating surface formed at a lower portion of said recess;

a watchglass having an outer diametric surface formed with a vertical portion having a height less than the height of an inner surface at the upper portion of said annular recess while the outer diameter of the watchglass is slightly less than the inner diameter of said flange, an inclined guiding surface at a portion below said outer diameteric surface and a recess provided in said diametric surface; and

a synthetic resin ring sandwiched between said annular recess and said watchglass and having a protrusion formed when said watchglass is press fitted into said synthetic resin ring, said protrusion engaging the recess of said watchglass to retain the same in a fixed position.

4,234,949

MULTIPLEXER AND TIME DURATION MEASURING CIRCUIT

James Gray, Jr., Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 10, 1979, Ser. No. 28,741

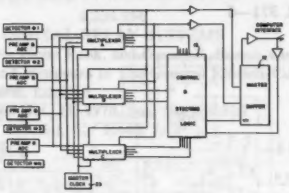
Int. Cl.³ H04L *5/00*

U.S. Cl. 370—41 **8 Claims**

1. A device for multiplexing data to a master storage from a plurality of pulse sources which randomly develop pulses, comprising:

a first multiplexer unit including a plurality of input circuits equal in number to the sources, each of said input circuits being coupled to a separate one of said sources and having first and second stable states indicated by different outputs therefrom and having a disabled state wherein said input circuits are prevented from switching from said one stable state to the other stable state, with all of said input circuits at said first stable state, one of said input circuits being responsive to the leading edge of a pulse of particular time duration from the source coupled thereto to assume said second stable state, disabling means coupled to said input circuits and responsive to the change in output of one of said input circuits assuming said second stable state to drive all of said input circuits to assume said disabled state,

with all of said input circuits at said disabled state said input circuit at said second stable state being responsive to the trailing edge of said pulse to assume said first stable state said particular time duration after assuming said second stable state, and register means coupled to said



input circuits and responsive to the output thereof to develop an output data signal indicating which of said input circuits assumes said second stable state and indicating said particular time duration, the master storage being coupled to said register means and being responsive to said output data signal to store said output signal.

4,234,950

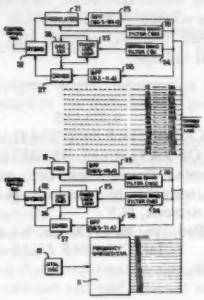
TELEPHONE STATION CARRIER SYSTEM

Sidney Browne, 6307 Crosswoods Cir., Falls Church, Va. 22044

Filed Apr. 25, 1979, Ser. No. 33,248

Int. Cl.[3] H04J *1/06*

U.S. Cl. 370—71 **22 Claims**



1. In a frequency-multiplexed carrier system of the type employing a common transmission line to service a plurality of remote subscriber circuits from a respective plurality of local circuits at a central location, each remote subscriber circuit being paired with a respective local circuit with which it alone communicates, a method comprising the steps of:

generating at said central location a frequency-stable first carrier signal for each local circuit, the first carrier signal for each local circuit having a different frequency, the frequencies of all of said first carrier signal residing in a first band of frequencies;

modulating said first carrier signal at each local circuit with externally-derived intelligence signals to derive a single sideband of said first carrier signal, the frequency bandwidth of said intelligence signals being less than the spacing between adjacent first carrier signal frequencies;

transmitting, from said central location to said remote circuits via said common transmission line, all of said first carrier signals and all of said single sidebands of said first carrier signals;

at each remote circuit, receiving from said common transmission line the first carrier signal and single sideband thereof for the local circuit with which that remote circuit is paired;

at each remote circuit, demodulating the received single sideband with the received first carrier signal to recover the externally-derived intelligence signals;

for all of said remote circuits, generating a translating signal having the same frequency at each remote circuit;

at each remote circuit, frequency-mixing said translating signal and the received first carrier signal to derive a second carrier signal, the second carrier signals at each remote circuit having different frequencies which reside in a second band of frequencies which does not overlap said first band of frequencies, the frequency difference between the received first carrier signal and the derived second carrier signal being equal to the frequency of said translating signal at all of said remote circuits;

modulating said second carrier signal at each remote circuit with externally derived further intelligence signals to derive a single sideband of said second carrier signal, the frequency bandwidth of said further intelligence signals being less than the spacing between adjacent second carrier signal frequencies;

transmitting from each remote circuit to said central location via said common transmission line, said derived single sideband of said second carrier signal;

at each local circuit, receiving from said common transmission line the single sideband of said second carrier signal transmitted from the remote circuit with which that local circuit is paired;

providing at each local station a second carrier signal to demodulate the received single sideband; and

at each local circuit, demodulating the received single sideband with the received second carrier signal to recover said further intelligence signal.

4,234,951

Patent Not Issued For This Number

4,234,952

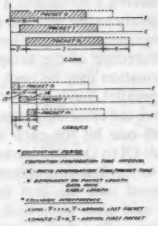
CONFLICT RESOLUTION BY RETRANSMISSION DELAY ON SHARED COMMUNICATION MEDIUM

Melvin G. Gable, Ypsilanti, and Richard H. Sherman, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 7, 1979, Ser. No. 46,577

Int. Cl.[3] H04J *6/00*

U.S. Cl. 370—94 **10 Claims**



1. A data communication modem adapted for use in conjunction with a plurality of other modems over a shared communication medium, said modem comprising:

a transmitting and receiving means for transmitting and receiving data over the communication medium;

a first sense means coupled to said modem for detecting carrier transmission from any of the modems on the communication medium (busy) and for detecting no transmission (idle) on the communication medium;

a second sense means for detecting simultaneous transmission (interference) of more than one modem;

a computation means for determining a first duration of time between the time of transition from an idle channel to a busy channel and the time of transmission interference, and a second duration of time between the time of transmission interference and the time of transition from a busy channel to an idle channel; and

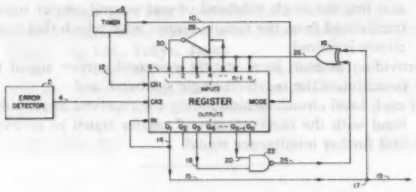
a control means responsive to outputs from said first sense means, said second sense means and said computation means for governing transmission of said modem so that said modem will not transmit until said first sense means is not detecting carrier transmission and will interrupt transmission if interference is detected by said second sense means.

4,234,953

ERROR DENSITY DETECTOR

Ralph L. Kline, Los Altos, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 7, 1978, Ser. No. 967,192
Int. Cl.[3] H04B *17/00*; G06F *11/00*
U.S. Cl. 371—5 **5 Claims**



1. In a digital transmission system in which the presence or absence of errors in a periodic framing pattern is used to determine if the system is properly synchronized, an error density detector comprising:

an error detector which provides an error output pulse at an output whenever an error is detected in the framing pattern;

a timer which provides at a first output a sample pulse at the beginning of each sample interval, said sample interval including a plurality of frames and said sample pulse occurring intermediate of said framing pattern; and at a second output a sample clock pulse which occurs within the time slot of the sample pulse; and

logic means comprising:

a programmable register having n programmable input terminals 1 to n, having a mode and a first clock input connected, respectively to the first and second outputs of said timer, said programmable input terminals being enabled during the occurrence of the sample pulse so that programmed information may be read into said input terminals 1 to n in parallel, having a second clock input connected to receive the error output pulses so as to cause the register to shift one bit for each error pulse, having n output terminals Q1 to Qn, and having a serial input terminal connected to the first output terminal Q1, whereby the state programmed into the first input terminal will be propagated by said error pulse and;

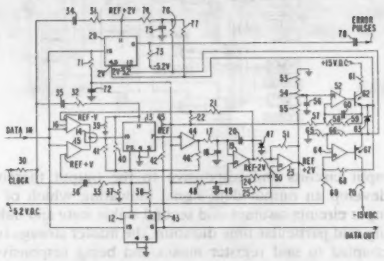
gating means for providing the program information and for providing an alarm indication, having a first input connected to Q1, having second and third inputs connected to appropriate output terminals of said register so that an alarm indication will occur only when at least a first predetermined number of errors have occurred during a sample interval and so that the alarm lead state will subsequently change if less than a second predetermined number of errors have occurred during a subsequent sample interval.

4,234,954

ON-LINE BIT ERROR RATE ESTIMATOR

Julius Lange, Sunnyvale, and Gary L. Wagner, Menlo Park, both of Calif., assignors to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Jan. 24, 1979, Ser. No. 6,054
Int. Cl.[3] H03K *13/32*; G06F *11/00*
U.S. Cl. 371—6 **16 Claims**



1. Apparatus for detecting the rate of error in an input binary coded data stream not including code characters of the parity check type, said apparatus comprising:

means for generating a relative test voltage equal to approximately twice the average relative signal voltage of the data stream; and

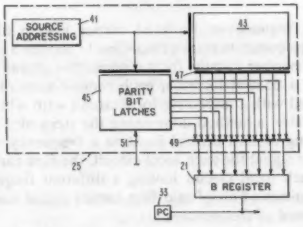
means connected to said generating means for producing an error pulse only whenever, at any one of many preselected sampling points clocked onto said producing means by clocking means connected thereto, the magnitude of the relative voltage of the data stream, including any noise superimposed thereon, exceeds the magnitude of said relative test voltage.

4,234,955

PARITY FOR COMPUTER SYSTEM HAVING AN ARRAY OF EXTERNAL REGISTERS

Thomas L. Jeremiah, Round Rock, Tex., and Karl F. Pezdirtz, Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,712
Int. Cl.[3] G06F *11/10*
U.S. Cl. 371—51 **15 Claims**



1. In a data processing system including an information processing unit utilizing an odd parity check for detecting machine malfunctions, and a plurality of external byte wide registers electrically connected into an M×N array, said array having a number of unusable registers whereby the number of usable registers is less than M times N, thereby leaving unimplemented bytes in the array of registers, means for implementing a parity bit for each of said unimplemented bytes in the array of registers, said means comprising:

a plurality of parity bit generating devices mapped to the configuration of said array of external registers, each bit

generating device upon activation providing a parity bit for its respective external register location; and

means for selectively activating said plurality of parity bit generating devices to activate those, and only those, devices corresponding to the unimplemented bytes in said array of external registers.

4,234,956

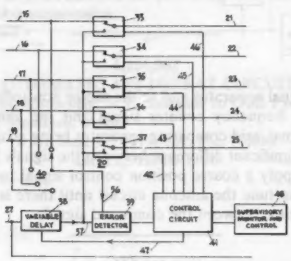
DIGITAL RELAY SYSTEMS

John A. Adderley, Holm Rook, and Dennis R. Bester, Coventry, both of England, assignors to The General Electric Company Limited, London, England

Filed Oct. 11, 1978, Ser. No. 950,514

Int. Cl.[3] H04K *1/00*

U.S. Cl. 375—38 **6 Claims**



1. A digital signal transmission system comprising:

(a) transmitting apparatus at a first station and

(b) receiving apparatus at a second station

(c) for providing a plurality of normal transmission channels and a standby channel between said first and second stations,

(d) means for applying digital information signals to the transmitting apparatus for transmission over the normal channels,

(e) switching means for selecting digital information signals in respect of any one of the normal channels for transmission over said standby channel,

(f) means providing a predetermined delay in each normal transmission channel,

(g) means providing a variable delay in said standby channel,

(h) comparator means

(i) for comparing digital information signals received over said standby channel and said selected normal channel and

(ii) for adjusting said variable delay means until said received signals are substantially in synchronism, and

(i) switching means responsive to an output signal from the comparator indicating that said received signals are in synchronism to effect the replacement of the selected normal transmission channel by the standby channel.

4,234,957

METHOD AND APPARATUS FOR GENERATING TIMING PHASE ERROR SIGNALS IN PSK DEMODULATORS

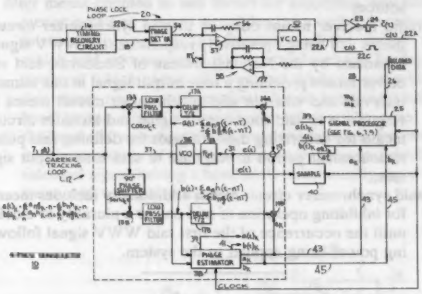
Robert J. Tracey, Downers Grove, Ill.; Stevan D. Bradley, Palo Alto, and William F. Hartley, Belmont, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 4, 1978, Ser. No. 966,228

Int. Cl.[2] H03D *3/18*; H04L *27/22, 25/40*

U.S. Cl. 375—86 **52 Claims**

21. In synchronous PSK data transmission system transmitting data pulses coded during sample intervals into the phase of a carrier frequency signal and including receiver circuitry responsive to a received data signal and a locally generated clock timing signal for producing a signal phase error signal and a differential phase signal indicating the difference $\Delta\theta_k$ between the phases θ_k of allowable phasors, of an ideal set of symbol phasors, that are associated with receive phasors in adjacent signal intervals, the improved method of producing a timing phase error signal comprising the step of combining the signal phase error signal and the differential phase signal indi-



cating the phase difference $\Delta\theta_k$ at sample times in a manner so as to produce a timing phase error signal in sample intervals which is a measure of the difference between the phase of the local clock timing signal and that of timing in the received data signal for use in the receiver circuitry for adjusting the phase of the local timing signal there to be more nearly equal to the phase of timing in the received data signal.

4,234,958

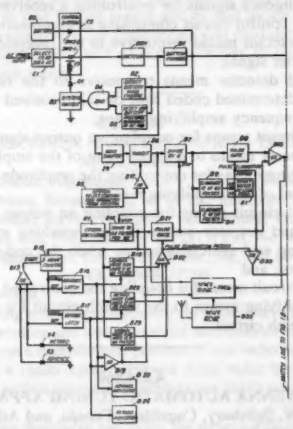
RADIO SYNCHRONIZED TIME-KEEPING APPARATUS AND METHOD

William F. Pipes, Smyrna; Roy V. Millsap, Roswell; Richard W. McClure, and Harrison G. Hooper, both of Atlanta, all of Ga., assignors to Lathem Time Recorder Co., Inc., Atlanta, Ga.

Filed Jun. 16, 1977, Ser. No. 807,011

Int. Cl.[3] H03K *1/17*

U.S. Cl. 375—107 **24 Claims**



1. In a time controller system of the type which supplies electrical timing pulses of a predetermined pulse rate derived from a frequency source to one or a plurality of clocks for driving the respective clock mechanisms included therein in response to the number of timing pulses received and wherein said system includes means for increasing or decreasing the timing pulse rate relative to said predetermined pulse rate for

advancing or retarding the time indication of said clocks, the improvement comprising:

synchronizer circuit means coupled to said system for automatically controlling said means for increasing or decreasing the timing pulse rate following at least one timing pulse measurement period, which period is derived from signals received from a predetermined standard signal source;

radio receiver means coupled to said synchronizer circuit means and being operatively responsive to a WWV signal broadcast by the National Bureau of Standards, said receiver means providing a tone output signal at one minute intervals and wherein said synchronizer circuit means is responsive to said tone output signal and includes circuit means for generating digital signals for defining said pulse measurement period in response to said tone output signals;

said synchronizer circuit means additionally includes means for inhibiting operation of said one or a plurality of clocks until the occurrence of the first said WWV signal following power being applied to the system.

4,234,959

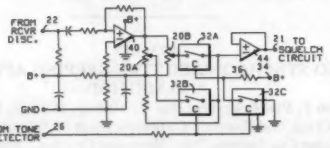
DUAL THRESHOLD REPEATER SQUELCH CIRCUIT

Ralph W. Andrea, III, Sunrise; Leonard W. Bennett, Plantation, and William W. O'Connor, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 12, 1979, Ser. No. 57,047

Int. Cl.³ H04B *1/10*

U.S. Cl. 455—35 **7 Claims**



1. A dual threshold squelch control circuit for use with received signals which may contain a coded tone in addition to the intelligence signals for controlling a receiver squelch circuit, the control circuit comprising in combination:

first detector means responsive to the reception of a usable carrier signal;

second detector means responsive to the reception of a predetermined coded tone on said received signal;

low frequency amplifying means;

first circuit means for coupling an output signal of the first detector means to a signal input of the amplifier means;

switching means for controlling the amplitude of the output signal of the amplifying means;

second circuit means for coupling an output signal of the second detector means to the switching means for enabling said switching means when the coded tone is detected; and

third circuit means for coupling the controlled output of the amplifying means to the squelch circuit for enabling said squelch circuit.

4,234,960

ANTENNA AUTOMATIC TUNING APPARATUS

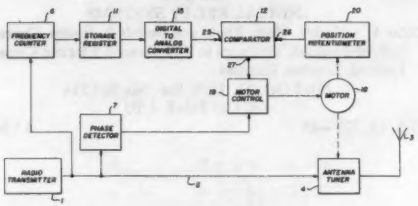
Ronald W. Spilsbury, Coquitlam, Canada, and Ashton J. Spilsbury, 6691 Madrona Crescent, West Vancouver, British Columbia, Canada (V7W 2J9), assignors to Ashton James Spilsbury, West Vancouver, Canada

Filed Jul. 3, 1978, Ser. No. 921,273

Int. Cl.³ H04B *1/04*

U.S. Cl. 455—123 **3 Claims**

1. Apparatus for automatically tuning an antenna circuit for an antenna to any transmitter signal of a radio transmitter coupled to said circuit, comprising a tuner for the antenna, a motor for operating the tuner, a controller for the motor, apparatus coupled to the tuner to produce an antenna tuner position signal in accordance with the impedance of the antenna circuit, a frequency counter coupled to the circuit and adapted to produce a frequency counter signal representative of the frequency of each transmitter signal and comparing apparatus coupled to the frequency counter and to the tuner



position signal apparatus and to the motor controller for comparing the frequency counter signal and the antenna tuner position signal, said comparing apparatus being adapted, when there is a significant difference between the signals being compared, to apply a coarse position control signal to the motor controller to tune the antenna circuit until there is no significant difference between the compared signals.

4,234,961

RECEIVER COMPRISING A TUNING MEMBER AND AN AUTOMATIC TUNING CORRECTION SUPPRESSION CIRCUIT

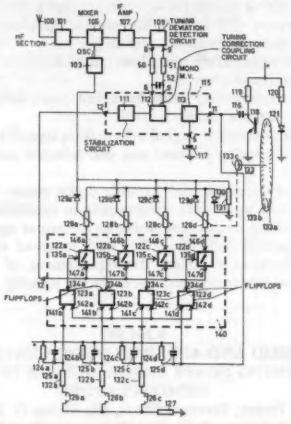
Arnoldus Garskamp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,789

Claims priority, application Netherlands, May 2, 1977, 7704772

Int. Cl.³ H04B *1/26*; H03J *7/02*

U.S. Cl. 455—160 **1 Claim**



1. A receiver having a tuning member, an automatic tuning correction circuit and an automatic tuning correction suppression circuit for disabling said automatic tuning correction circuit when said tuning member is operated, said receiver further comprising a light-emitting element, a light-sensitive semiconductor arranged in a fixed position relative to said light-emitting element for the illumination thereby, a light-interrupting element operatively coupled to said tuning member and arranged in a movable manner, relative to said light-

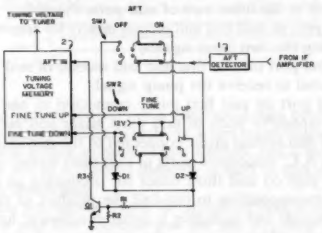
sensitive semiconductor and said light-emitting element, for selectively blocking, depending upon the position thereof, the light passing from said light-emitting element to said light-sensitive semiconductor, a differentiating network coupled to said light-sensitive semiconductor for differentiating the output thereof, said suppression circuit being coupled to an output of said differentiating circuit at least one preselection-adjusting element, and a switch-over circuit coupled to said preselection-adjusting element for switching over the receiver tuning from said preselection-adjusting element to manual tuning by said tuning member, wherein said switch-over circuit includes a control input coupled to said differentiating network whereby movement of said tuning member will result in a differentiated signal from said light-sensitive semiconductor for activating said switch-over circuit and for providing said automatic tuning correction suppression.

4,234,962

AUTOMATIC AFT DEFEAT CIRCUIT

Jon L. Hoeft, Rochester, N.Y., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 17, 1979, Ser. No. 76,016
Int. Cl.³ H04B 1/16
U.S. Cl. 455—173 **12 Claims**



1. An automatic AFT defeat circuit for a tuning voltage memory system having both AFT and FINE TUNING inputs, the defeat circuit comprising:

a source of fine tuning voltage,

a manual FINE TUNE switch having first and second sections, each with respective first, second and third terminals wherein the switch is so arranged and constructed that the first and second terminal of each section are connected when the FINE TUNE switch is activated and the second and third terminals are connected when the FINE TUNE switch is de-activated, and wherein:

(1) the first terminal of the first section is connected to the FINE TUNING input,

(2) the second and third terminals of the first section are connected to the source of FINE TUNING voltage,

(3) the second terminal of the second section is connected to the AFT input, and

(4) the third terminal of the second section is coupled to the output of an AFT detector.

4,234,963

SYNCHRONOUS DETECTOR PARTICULARLY ADAPTED FOR A VIDEO IF SIGNAL

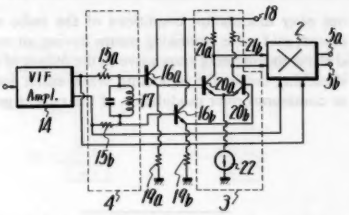
Masayuki Hongu, Kawasaki; Hiromi Kawakami, Yokohama, and Masaharu Tokuhara, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 16, 1978, Ser. No. 906,406
Claims priority, application Japan, May 19, 1977, 52-64105[U]
Int. Cl.³ H04B 1/30, 1/66
U.S. Cl. 455—204 **7 Claims**

1. A synchronous detector adapted to detect an information signal modulated onto a carrier, such as a video IF signal, comprising:

means for supplying said modulated information signal in the form of a vestigial sideband signal having a broad bandwidth sideband on a first side of said carrier and a vestigial sideband on a second side of said carrier;

filter means coupled to said means for supplying, said filter means including a tuned circuit having a center frequency substantially equal to the frequency of the carrier on which said information signal is modulated and having a passband which passes said vestigial sideband and which also passes only a portion of said broad bandwidth sideband having a band of frequencies substantially equal to the band of frequencies of said vestigial sideband for limiting the spectrum of the signal passed thereby to a double sideband signal having a bandwidth substantially equal to twice said vestigial sideband;



a differential amplifier having first and second inputs for differentially receiving the double sideband signal passed by said filter means, said differential amplifier being effective to limit said double sideband signal and to thereby derive a switching carrier therefrom, the frequency of said switching carrier being equal to the frequency of the carrier on which said information signal is modulated;

emitter-follower means connected between said filter means and said limiter means for coupling said double sideband signal from said filter means to said limiter means; and

multiplier means having first and second input terminals coupled to said limiter means and to said means for supplying, respectively, for multiplying said modulated information signal with said switching carrier to obtain said information signal.

4,234,964

RADIO RECEIVER MONITORING AND TESTING APPARATUS

Richard F. Cieslak, Algonquin; John V. Balding, Palatine, and Joseph Lafrenz, Schaumburg, all of Ill., assignors to Industrial Electronics Service Company, Schaumburg, Ill.

Division of Ser. No. 795,778, May 11, 1977, Pat. No. 4,143,323. This application Oct. 2, 1978, Ser. No. 948,054
Int. Cl.³ H04B 17/00
U.S. Cl. 455—226 **7 Claims**

1. Monitoring and testing circuitry for attachment to a radio receiver to monitor and test a detected intermediate frequency (IF) signal from a demodulator portion of said radio receiver to determine if a radio signal received from radio transmitting equipment is within permissible modulation limits and circuitry comprising:

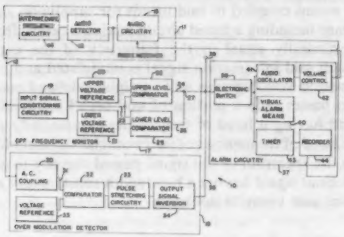
AC coupling means for receiving the detected IF signal and for blocking the DC component thereof while passing the audio frequencies;

a modulation voltage reference related in magnitude to the maximum permissible modulation level of the radio signal;

comparator means for comparing the audio signal from the AC coupling means to the modulation voltage reference, said comparator changing an output state whenever the audio signal exceeds said modulation voltage reference;

pulse stretching means between said comparator means and

an alarm means for providing a changed output state of a predetermined interval whenever a changed output state from the comparator means is received by the pulse stretching means such that intermittent as well as continuous over modulation conditions of the radio signal are sensed, said pulse stretching means having an output; and said alarm means being responsive to the output of said pulse stretching means for indicating when either intermittent or continuous over modulation of the radio signal exists.

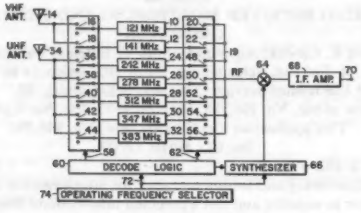


4,234,965

COMMUNICATION TUNING SYSTEM UTILIZING LOCAL OSCILLATOR FREQUENCY SELECTION FOR MAXIMUM RF FILTER BANDWIDTH AND METHOD THEREOF

Robert H. Bickley; Ronald C. Briggs, and Ronald C. Jost, all of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1978, Ser. No. 920,049
Int. Cl.[3] H04B *1/04, 1/06*
U.S. Cl. 455—285 **6 Claims**



2. A transmitter radio frequency (RF) section for transmitting a RF signal having a frequency within a band of frequencies comprising:

(a) a plurality of bandpass filters each having a predetermined bandpass range of frequencies;

(b) logic means for selecting one of said plurality of bandpass filters for passing an RF signal within the bandpass of said bandpass filter; and

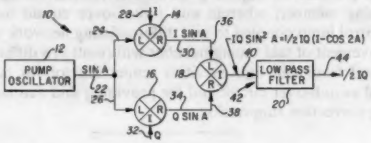
(c) a local oscillator having a frequency determined by said logic means such that said frequency of said local oscillator is placed outside of said predetermined bandpass range of said selected bandpass filter.

4,234,966

DOUBLE BALANCED DIODE MIXER WITH D.C. RESPONSE

William H. Mosley, Jr., St. Petersburg, and Carl F. Andren, Indialantic, both of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Feb. 26, 1979, Ser. No. 15,231
Int. Cl.[3] H04B *1/26*
U.S. Cl. 455—326 **13 Claims**



1. A direct current responsive mixing circuit for receiving two input signals and a pump signal and producing an output signal having a signal component corresponding to the product of the input signals comprising:

first, second and third mixers, each of said mixers having a first D.C. responsive port, and second and third A.C. responsive ports, each of said mixers generating a signal at one of said ports corresponding to the product of signals received at the other two of said ports thereof;

said first port on said first and second mixers for respectively receiving the two input signals;

said second port on said first and said second of said mixers connected to receive the pump signal;

said third port on said first mixer connected to one of the A.C. responsive ports of said third mixer and said third port of said second mixer connected to the remaining one of said A.C. responsive ports of said third mixer; and

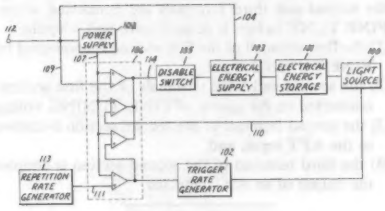
said first port on said third mixer for producing an output signal corresponding to one-half the product of the two input signals and including a signal component having a frequency which is twice the frequency of the pump signal.

4,234,967

OPTICAL SIGNAL TRANSMITTER

John P. Henschel, White Bear, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 20, 1978, Ser. No. 952,959
Int. Cl.[3] H04B *9/00, 1/04;* **H02J** *9/02;* **H01M** *10/44*
U.S. Cl. 455—603 **8 Claims**



1. An optical signal transmitter having,

a light source for converting stored electrical energy into light energy in response to a trigger signal,

trigger means for providing a trigger repetition rate signal having a controlled repetition rate,

electrical energy storage means, and

electrical energy supply means for supplying electrical energy to said electrical energy storage means; wherein the improvement comprises

means for disabling said electrical energy supply means in response to a disable signal,

means for generating a reference signal,

means for generating an input signal indicative of a measured operating condition, and

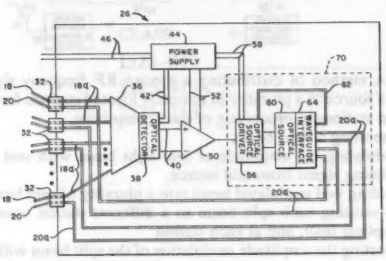
means for comparing said reference signal with said input signal to generate said disable signal for controlling said electrical energy supply means such that said light source is operable only under predetermined operating conditions.

4,234,968

OPTICAL COUPLER MODULE IN A DISTRIBUTED PROCESSING SYSTEM

Amar J. Singh, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 5, 1978, Ser. No. 939,726
Int. Cl.[3] H04B 9/00; G02B 5/172
U.S. Cl. 455—607 2 Claims



1. An optical coupler for a distributed data processing system having a plurality of stations, a first transmission line from an optical source in each of said stations, and a second transmission line to an optical detector in each of said stations, the coupler comprising:

optical waveguide means for receiving optical signals from any said first transmission line and directing the optical signals to a single optical path;

means for amplifying the optical signals on the single optical path, including optical detector means for converting the optical signals on the single optical path to electrical signals, electrical amplifying means for amplifying the electrical signals from said optical detector means, and optical source means for converting the amplified electrical signals to optical signals, said optical source means including an optical source driver; and

means for distributing the amplified optical signals to each said second transmission line, including a waveguide interface for receiving the optical signals from said optical source means at one end face and having an opposite end face cooperating with a plurality of waveguide segments to provide the optical signals received at the one end face to each of the waveguide segments, one of the waveguide segments providing a feedback signal to said optical source driver, and each of the other waveguide segments providing the optical signals from the waveguide interface to an associated second transmission line.

4,234,969

BIDIRECTIONAL OPTICAL COUPLER FOR A DATA PROCESSING SYSTEM

Amar J. Singh, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 5, 1978, Ser. No. 939,727
Int. Cl.[3] H04B 9/00; G02B 5/172
U.S. Cl. 455—607 8 Claims

1. In a data processing system having a plurality of stations and optical transmission means interconnecting the stations, the improvement wherein the optical transmission means comprises:

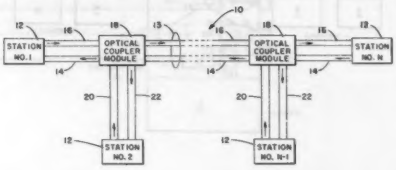
a data bus, including first transmission line means for carrying an optical signal in one direction and second transmission line means for carrying an optical signal in a second opposite direction simultaneously so that two of the stations may communicate with each other simultaneously over said first and said second transmission line means;

third transmission line means associated with each one of the stations for receiving an optical signal from an optical source in the station;

fourth transmission line means associated with each one of the stations for carrying an optical signal to an optical detector in the station; and

an optical coupler module for coupling each of the stations to said data bus, comprising:

optical beam splitting means associated with each of said first, said second, and said third transmission line means for splitting portions of the optical signals on said first and said second transmission line means for said fourth transmission line means and for splitting portions of the optical signal on said third transmission line means from the optical source for each of said first and said second transmission line means; and



optical waveguide means associated with each of said first, said second and said fourth transmission line means, said waveguide means associated with said fourth transmission line means being connected for receiving portions of the optical signals from said first and said second transmission line means and directing the portions of the optical signals from said first and said second transmission line means into a single optical path for said fourth transmission line means to said optical detector, said waveguide means associated with said first transmission line means and associated with said second transmission line means each being connected for receiving portions of the optical signal from said third transmission line means and directing the portion of the optical signal from said third transmission line means into a single optical path for said first transmission line means and a single optical path for said second transmission line means.

4,234,970

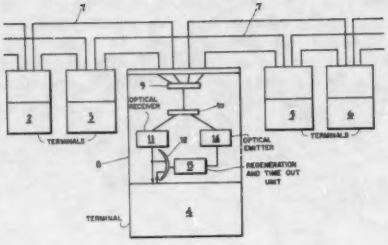
FIBER OPTIC COMMUNICATION SYSTEM

Robin D. Beasley, Chatham; Trevor I. Hall, Rochester, and Trevor A. Morgon, Rainham, all of England, assignors to Elliott Brothers (London) Limited, Chelmsford, England

Filed Oct. 27, 1978, Ser. No. 955,460
Claims priority, application United Kingdom, Nov. 3, 1977, 45764/77
Int. Cl.[3] H04B 9/00
U.S. Cl. 455—607 10 Claims

1. A multi-access fibre optic communication system comprising at least a first terminal, a second terminal and a third terminal, said first terminal being connected to transmit optical signals directly to at least said second terminal and said third terminal, and said second terminal being connected to transmit optical signals directly to at least said third terminal, wherein

said second terminal includes regenerating means whereby an optical signal received by that terminal is re-transmitted to all the terminals to which that terminal is connected to transmit signals directly.

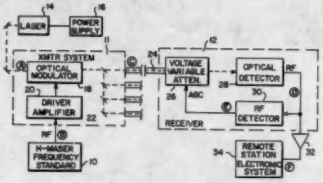


4,234,971

PRECISE RF TIMING SIGNAL DISTRIBUTION TO REMOTE STATIONS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Georg F. Lutes, Jr., Glendale, Calif.

Filed Sep. 24, 1979, Ser. No. 78,521
Int. Cl.³ H04B 9/00
U.S. Cl. 455—619 6 Claims



1. A method of distributing a precise RF frequeny signal from a source to a plurality of remotely located stations for use at said stations in processing of data comprising,

generating a light beam,

modulating the amplitude of said light beam with said RF timing signal from said source,

dividing said modulated beam into a plurality of split beams,

transmitting each split beam to a different station over an optical fiber, and at each station

detecting the amplitude modulation of the split beam with an optical detector to produce an RF electrical signal that conforms in frequency with said RF reference signal from said source for use at the station,

detecting the average amplitude of said RF electrical signal to produce an automatic gain control signal, and

controlling an optical attenuator at the input of said optical detector for automatic gain control of said RF electrical signal without introducing any appreciable phase shift.

DESIGN PATENTS

GRANTED NOV. 18, 1980

ERRATA

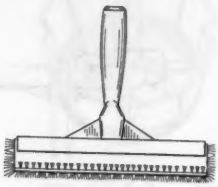
For CLASS	See PATENT NO.
D23–019	257,543
D23–019	257,544
D21–213	257,545

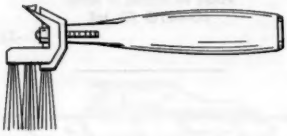
257,521

COMBINED BRUSH AND SCRAPER

Niccolai Piero, Pistoia, Italy, assignor to Action Industries, Inc., Cheswick, Pa.

Filed May 30, 1978, Ser. No. 910,599
Term of patent 14 years
Int. Cl. D4—*01*; D7—*05*
U.S. Cl. D4—06



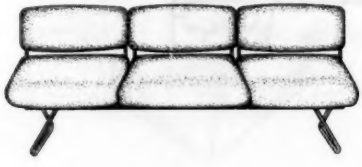


257,522

MULTIPLE SEATING UNIT

Roger K. Leib, 1064 S. Crescent Heights Blvd., LosAngeles, Calif. 90035

Filed Oct. 16, 1978, Ser. No. 951,343
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—59

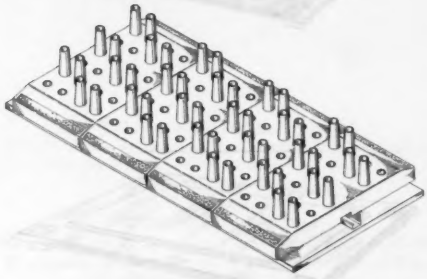


257,523

SKI POLE STORAGE RACK

James D. Allsop, 2144 Dellesta Dr., Bellingham, Wash. 98225

Filed Mar. 17, 1978, Ser. No. 887,990
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—157



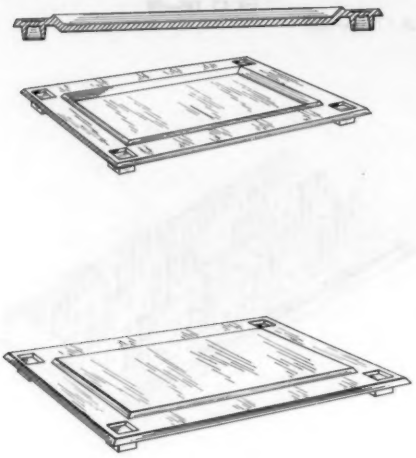
257,524

DRINKING MUG

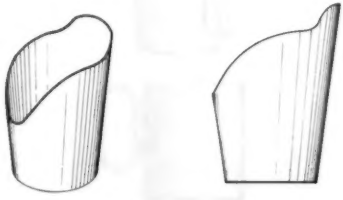
William Heinrich, McHenry, Ill., assignor to Volna Promotions, Inc.

Filed Mar. 12, 1979, Ser. No. 19,844
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—9

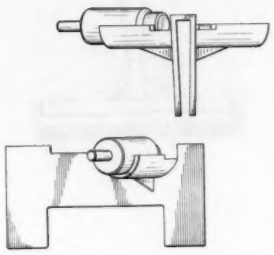
257,525
SERVING TRAY
Alwin J. Stahel, II, New Brighton, Minn., assignor to Princeton Industries Corporation, Princeton, Ind.
Filed Aug. 2, 1978, Ser. No. 930,542
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—37



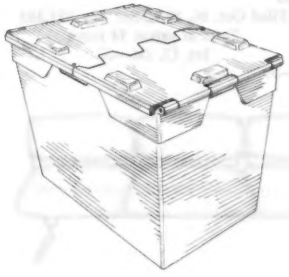
257,526
COMBINED SCOOP AND SERVING CUP
David H. Herbst, Reistertown, and Patrick T. Boyle, Baltimore, both of Md., assignors to Maryland Cup Corporation, Owings Mills, Md.
Filed Oct. 20, 1978, Ser. No. 953,104
Term of patent 14 years
Int. Cl. D07—*01, 99*
U.S. Cl. D7—104



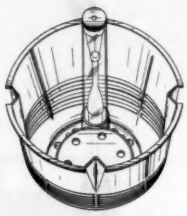
257,527
SAW CHAIN SHARPENING ASSEMBLY
Frank J. Aksamit, West Hartford, Conn., assignor to Pro Sharp Corporation
Filed Jan. 6, 1978, Ser. No. 867,627
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D8—71



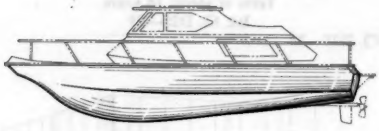
257,528
CONTAINER BIN
Richard S. Cherry, Don Mills, Canada, assignor to Phillips-Parkway Corporation, Toronto, Canada
Filed Sep. 6, 1978, Ser. No. 940,111
Claims priority, application Canada, Jul. 20, 1978, 2007784
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—431



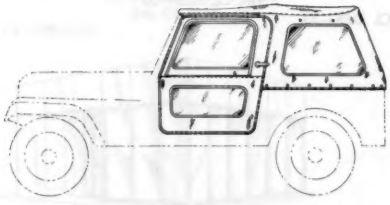
257,529
COMBINED PLANT POT LINER AND WATER LEVEL GAUGE
Joachim E. Raap, Dallas, Tex., assignor to Casa Flora, Inc., Dallas, Tex.
Filed Mar. 20, 1978, Ser. No. 888,685
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—164



257,530
BOAT HULL
Richard D. Moyer, 45 Ardmore Ave., Hermosa Beach, Calif. 90254
Filed Jan. 23, 1978, Ser. No. 871,559
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—70

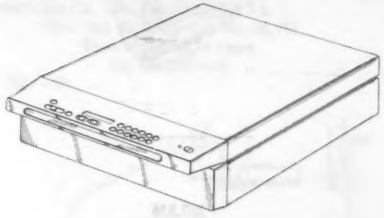


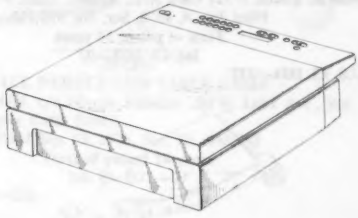
257,531
VEHICLE TOP
Kim M. Hickman, and Ralph C. Young, both of Colorado Springs, Colo., assignors to White Automotive Corporation, Colorado Springs, Colo.
Continuation-in-part of Ser. No. 695,163, Jun. 11, 1976, Pat. No. Des. 250,330. This application Jun. 14, 1978, Ser. No. 915,404
The portion of the term of this patent subsequent to Nov. 21, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



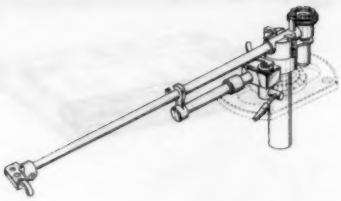
257,532
RUNNING BOARD
Merlyn C. Okland, 204 W. Broad St., Story City, Iowa 50248
Filed Dec. 14, 1978, Ser. No. 969,370
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203

257,533
VIDEO DISK PLAYER
Ernest M. Bevilacqua, Wilton; Gordon P. Bruce, New Milford; David C. Danielson, Rowayton, all of Conn.; Daniel J. Formosa, Fort Lee, N.J.; Allen D. Hawthorne, New Canaan, Conn.; Kurt Roehrs, Clintondale, N.Y.; Paul F. Siegel, Norwalk, Conn.; Eliot F. Noyes, deceased, late of New Canaan, Conn. (by Mary D. Noyes, executrix), and by New England Merchants National Bank, executor, Milton, Mass., assignors to Discovision Associates, Costa Mesa, Calif.
Filed May 22, 1978, Ser. No. 908,594
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—3

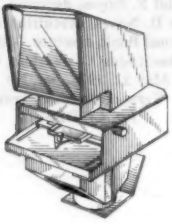




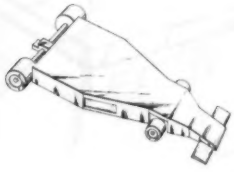
257,534
TONE-ARM
Makoto Ikeda, Machida, Japan, assignor to R & D Office Makoto Ltd., Machida, Japan
Filed Jun. 23, 1978, Ser. No. 918,557
Claims priority, application Japan, Dec. 26, 1977, 52-51814
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—27



257,535
MICROFILM READER
John R. Zellner, Menomonee, and Eino M. Lehto, Juneau, both of Wis., assignors to Bell & Howell Company, Chicago, Ill.
Filed Jun. 5, 1978, Ser. No. 912,827
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—11

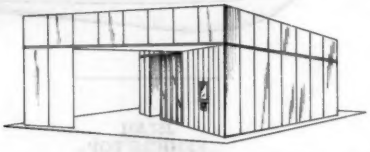


257,536
SKATEBOARD
John R. Lukes, 17914 Gard Ave., Artesia, Calif. 90701
Filed Jun. 8, 1978, Ser. No. 915,199
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—227

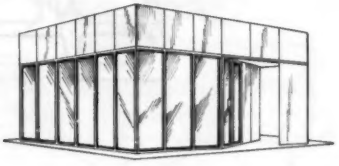


257,537
SPRAY WAND
Ho Chow, River Edge, N.J., and David Muramatsu, Long Beach, Calif., assignors to Beatrice Foods Co., Chicago, Ill.
Filed Oct. 10, 1978, Ser. No. 949,744
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17

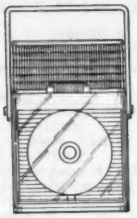
257,538
DRIVE-UP BANKING BUILDING
James S. Berman, New York, N.Y., assignor to Citibank, N.A., New York, N.Y.
Filed Sep. 22, 1978, Ser. No. 944,874
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—33



257,539
WALK-UP BANKING BUILDING
James S. Berman, New York, N.Y., assignor to Citibank, N.A., New York, N.Y.
Filed Sep. 22, 1978, Ser. No. 944,875
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—33

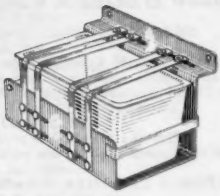


257,540
LANTERN
Wan K. Yip, Kowloon, Hong Kong, assignor to Chung Ah Manufacturing Co., Ltd., Kowloon, Hong Kong
Filed Oct. 30, 1978, Ser. No. 956,598
Claims priority, application United Kingdom, Aug. 17, 1978, 985980/78
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—41

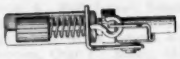


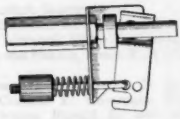
257,541
NAIL BUFFER
James H. Fox, New York; Gerald Yablans, Sands Point, and Stephan A. Tuchman, Rockville Centre, all of N.Y., assignors to Andrea Raab Corporation, Brooklyn, N.Y.
Continuation-in-part of Ser. No. 773,257, Mar. 1, 1977, abandoned. This application Feb. 5, 1979, Ser. No. 9,198
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—59

257,542
FOAL FEEDER
Andrew Gorretta, 339 Bentleyville Rd., Moreland Hills, Ohio 44022
Filed Mar. 13, 1978, Ser. No. 885,698
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

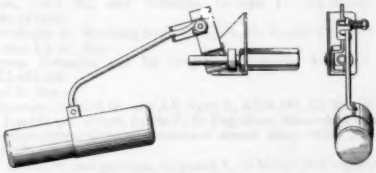


257,543
POULTRY WATERING VALVE
William H. Johnson, Harrisonburg, Va., assignor to Shenandoah Manufacturing Co., Inc., Harrisonburg, Va.
Filed May 11, 1979, Ser. No. 38,102
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19





257,544
POULTRY WATERING VALVE
William H. Johnson, Harrisonburg, Va., assignor to Shenandoah Manufacturing Co., Inc., Harrisonburg, Va.
Filed May 11, 1979, Ser. No. 38,103
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



257,545
BALL PADDLE FOR TABLE GAME
Bertrand Castelli, c/o Myron Salisian, 251 S. Lake Ave., Ste. 701, Pasadena, Calif. 91101
Filed Sep. 25, 1978, Ser. No. 945,182
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—213

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF NOVEMBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
Clutter, Melvin E., 4,234,753, Cl. 174-5.00R.

A. B. Dick Company: *See*—
Arway, George W., 4,234,885, Cl. 346-140.00R.

A. E. Moore Company, Inc.: *See*—
Barrett, Jack E. J., 4,234,833, Cl. 318-282.000.

A. E. Staley Manufacturing Company: *See*—
Howard, Paulette A.; Campbell, Michael F.; and Zollinger, David T., 4,234,620, Cl. 426-656.000.

A/S Hoyer-Ellefsen: *See*—
Gjerde, Trygve; Vigander, Kjell; Jenssen, Dag N.; and Hjertas, Bjorn, 4,234,270, Cl. 405-202.000.

AB Dentatus: *See*—
Edwardson, Svante R., 4,233,850, Cl. 74-44.000.

AB Siwertell: *See*—
Tingskog, Karl A. L., 4,234,075, Cl. 199-594.000.

Abbott, Bernard J.; and Whitney, John G., to Eli Lilly and Company. Method of preparing mycophenolic acid glucoside. 4,234,684, Cl. 435-75.000.

Abbott Laboratories: *See*—
Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, 4,234,720, Cl. 542-413.000.
Winn, Martin; Nordeen, Carl W.; and Arendsen, David L., 4,234,594, Cl. 424-273.00P.

Abele, Alan C. Rainwater gauge. 4,233,841, Cl. 73-171.000.

Abell, Ralph N. Sandblasting apparatus. 4,233,785, Cl. 51-427.000.

Aberg, Ulf L.: *See*—
Soderqvist, Gunnar M. T.; and Aberg, Ulf L., 4,234,329, Cl. 65-2.000.

Abo, Toshimi, to Nissan Motor Company, Limited. Exhaust gas recirculation system having a solenoid duty compensation circuit for an internal combustion engine. 4,233,947, Cl. 123-571.000.

Abolins, Visvaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., to General Electric Company. Compositions comprising copolymers of a vinyl aromatic compound and an unsaturated cyclic anhydride and impact improvers. 4,234,701, Cl. 525-68.000.

ACF Chemiefarma N.V.: *See*—
Akkerman. Antony M.; Van Bakel, Hermanus C. C. K.; and van Breevoort-Uurbanus, Henriette G., 4,234,591, Cl. 424-267.000.

ACF Industries, Incorporated: *See*—
Behle, Gunter R., 4,234,160, Cl. 251-144.000.
Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., 4,234,158, Cl. 251-144.000.
Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., 4,234,159, Cl. 251-144.000.

Acquarulo, Frank, Jr.: *See*—
Apuzzo, Louis J., Jr.; and Acquarulo, Frank, Jr., 4,234,104, Cl. 222-94.000.

Acree, Claude: *See*—
Jenkins, Robert E.; and Acree, Claude, 4,234,010, Cl. 137-242.000.

Acrow-Richmond Limited: *See*—
Wepf, Alfred, 4,234,156, Cl. 249-40.000.

Adachi, Takeshi; Koike, Masahiko; and Takahashi, Toshiyuki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with automatic trill performance function. 4,233,875, Cl. 84-1.240.

Adams, Michael B.; Angold, John A.; Morrison, Robert B.; and Zimmerman, Robert E., to Itel Corporation. Railway car assembly composed of a series of articulately interconnected cars. 4,233,909, Cl. 105-4.00R.

Adderley, John A.; and Bester, Dennis R., to General Electric Company Limited, The. Digital relay systems. 4,234,956, Cl. 375-38.000.

Adelson, Alexander M.; Gulick, Stephen C.; and Grubin, Arnold L., to Dimensional Communications, Inc. Electrical game, polling and testing apparatus. 4,234,933, Cl. 364-900.000.

Adidas Fabrique de Chaussures de Sport: *See*—
Anderie, Wolf, 4,234,208, Cl. 280-614.000.

Adidas Sportschuhfabriken Adi Dassler KG: *See*—
Bente, Alfred; Dassler, Adolph, deceased; and Henkel, Albert, legal representative, 4,233,759, Cl. 36-59.00R.

Advanced Mineral Research AB: *See*—
Kihlstedt, Per G.; Hassler, Hedvig E. B.; and Odeen, Kai, 4,234,380, Cl. 162-152.000.

Aerpat A.G.: *See*—
McGauran, Hugh K.; and Saunders, Leonard, 4,233,878, Cl. 85-7.000.

AFA Corporation, The: *See*—
Quinn, David R.; and Wesner, Walter H., 4,234,128, Cl. 239-478.000.

Agar Ginosar Electronics and Metal Products: *See*—
Tannenbaum, Joseph, 4,233,986, Cl. 128-421.000.

Agence National de Valorisation de la Recherche (ANVAR): *See*—
Defebvre, Andre; and Pouliquen, Jean, 4,233,849, Cl. 73-812.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Richard, Andre M. E., 4,233,862, Cl. 74-866.000.

Agfa-Gevaert AG: *See*—
Muller, Jurgen, 4,234,795, Cl. 250-468.000.

Aihara, Takayuki: *See*—
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,234,023, Cl. 141-99.000.

Airhart, Tom P., to Skyline Industries, Inc. Carbon fiber-reinforced plastic arrow. 4,234,190, Cl. 273-420.000.

Aisan Industry Co., Ltd.: *See*—
Arai, Hisaharu, 4,234,524, Cl. 261-41.00D.
Yorioka, Keigo; and Minoura, Mikio, 4,233,946, Cl. 123-568.000.

AIT Industries, Inc.: *See*—
Loreto, Wilfredo P., 4,233,784, Cl. 51-105.0LG.

Ajax Machine & Welding Co.: *See*—
Casad, Edward F.; and Casad, Thomas R., 4,233,923, Cl. 114-253.000.

Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Dry image forming materials. 4,234,679, Cl. 430-619.000.

Akins, Robert J., to CarboMedics, Inc. Prosthetic device couplings. 4,233,690, Cl. 3-1.500.

Akkerman, Antony M.; Van Bakel, Hermanus C. C. K.; and van Breevoort-Uurbanus, Henriette G., to ACF Chemiefarma N.V. Analgesic and morphine-antagonistic 9-phenyl-6,7-benzomorphans. 4,234,591, Cl. 424-267.000.

Akopian, Leonid A.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.

Aktiengesellschaft Adolph Saurer: *See*—
Hutter, Willi; and Huber, Kurt, 4,234,787, Cl. 235-92.0MP.

Aktieselskabet MEC Mekanisk Elektrisk Compagni af 1975: *See*—
Brandt, Gert M.; and Hansen, Soren R., 4,234,769, Cl. 200-67.0DB.

Akzo N.V.: *See*—
Cornelissens, Emery G. P., 4,234,442, Cl. 252-90.000.
Groenenboom, Cornelis J.; Huysmans, Willem G. B.; Burley, Joseph W.; Hutton, Ronald E.; and Jolley, Michael R. J., 4,234,501, Cl. 260-429.700.

Alack, Charles S.: *See*—
Handleman, Avrom R.; and Alack, Charles S., 4,234,273, Cl. 406-90.000.

Alafandi, Hamid; and Stamires, Dennis, to Filtrol Corporation. Crystallized silica-alumina cogel and catalyst employing the same. 4,234,457, Cl. 252-438.000.

Alcuri, Louis F.: *See*—
Aliotta, Joseph; and Alcuri, Louis F., 4,234,339, Cl. 75-255.000.

Alden, John M.; and Williams, George C., to Alden Research Foundation. Electric graphic recorder. 4,234,886, Cl. 346-165.000.

Alden Research Foundation: *See*—
Alden, John M.; and Williams, George C., 4,234,886, Cl. 346-165.000.

Alessi, Anthony A. Notching tool. 4,233,871, Cl. 83-607.000.

Alfa Romeo S.p.A.: *See*—
Rogora, Edoardo; and De Angelis, Giancarlo, 4,233,943, Cl. 123-425.000.

Ali, Syed S.: *See*—
Hodgeman, Herbert H.; and Ali, Syed S., 4,234,157, Cl. 251-56.000.

Aliotta, Joseph; and Alcuri, Louis F., to Engelhard Minerals & Chemicals Corporation. Corrosion-resistant dental alloy. 4,234,339, Cl. 75-255.000.

Allen, Kenneth P.; and Redeker, Maynard S., to Mobil Oil Corporation. Determination of reflectivity and water depth for marine seismic exploration. 4,234,938, Cl. 367-24.000.

Allen, Mark S., to Hewlett-Packard Company. Automatic control of arming signal for time interval measurements. 4,234,845, Cl. 324-83.00D.

Allied Chemical Corporation: *See*—
Linares, Robert C., 4,234,376, Cl. 156-617.0SP.

Allis-Chalmers Corporation: *See*—
Quick, David C., 4,233,857, Cl. 74-665.0GA.

Allwood, Inc.: *See*—
Olson, Alvin E., 4,233,753, Cl. 34-16.500.

Almen, Rune, to Sensotherm AB. Radiator. 4,234,039, Cl. 165-67.000.

Alpha Therapeutic Corporation: *See*—
Safianoff, Albert, 4,234,095, Cl. 215-232.000.

Alsip, Bruce F. Strategy and perception game. 4,234,185, Cl. 273-243.000.

Alsthom-Unelec: *See—*
Prevotat, Gerard, 4,234,862, Cl. 336-5.000.
Aluminum Company of America: *See—*
Dreinhoefer, Louis H.; Nolen, David W.; and Donatelli, Paul C., 4,234,832, Cl. 318-146.000.
Amancharla, Amareswar, to Baker International Corporation. Conduit sealing system. 4,234,197, Cl. 277-124.000.
Amari, Masaharu: *See—*
Tada, Tetsuya; and Amari, Masaharu, 4,234,127, Cl. 239-333.000.
Amato, Michael G. Portable security wall. 4,233,699, Cl. 5-426.000.
Amax Inc.: *See—*
Hepworth, Malcolm T.; and Laferty, John M., 4,234,393, Cl. 204-1.500.
Amazonen-Werke H. Dreyer GmbH & Co. KG: *See—*
Dreyer, Heinz, 4,234,129, Cl. 239-661.000.
Amembal, Amar; Bostwick, Robert; and Shaw, Richard G., to Union Carbide Corporation. Reprocessable thermoplastic graft copolymer of propylene polymer and ethylene copolymer. 4,234,656, Cl. 428-379.000.
Amer-O-Matic Corporation: *See—*
Long, William J.; Roberts, Larry W.; and Williams, H. Ross, 4,233,800, Cl. 53-381.00R.
Amerace Corporation: *See—*
Simons, Craig W., 4,234,755, Cl. 174-19.000.
Simons, Craig W., 4,234,757, Cl. 174-73.00R.
American Can Company: *See—*
Blakeslee, Harry N., 4,233,932, Cl. 118-306.000.
American Color & Chemical Corporation: *See—*
Botros, Raouf; and Riggle, Ivan E., 4,234,483, Cl. 260-207.100.
American Cyanamid Company: *See—*
Tresner, Homer D.; Fantini, Amedeo A.; Borders, Donald B.; and McGahren, William J., 4,234,717, Cl. 536-17.00R.
American Hospital Supply Corporation: *See—*
Rippe, Delfin F., 4,234,563, Cl. 424-8.000.
American Medical Systems, Inc.: *See—*
Bradley, William E.; Klatt, William M.; Kuyava, Charles C.; and Dreher, Robert D., 4,233,991, Cl. 128-733.000.
American Publishing Corporation: *See—*
Paparella, James B., 4,234,774, Cl. 200-330.000.
American Screen Printing Equipment Company: *See—*
Lala, Louis A., 4,233,897, Cl. 101-123.000.
American Thermometer Co., Inc.: *See—*
Hutten, James E., 4,234,084, Cl. 206-306.000.
AMF Incorporated: *See—*
Spurgeon, Peter J. C., 4,234,102, Cl. 222-55.000.
Amimoto, Hiroyuki: *See—*
Ishida, Kozo; Amimoto, Hiroyuki; and Saitoh, Osamu, 4,234,255, Cl. 350-274.000.
AMP Incorporated: *See—*
Bowen, Terry P.; Hoover, Charles D.; Ferdon, Gilbert D.; and Harwood, Robert G., 4,233,724, Cl. 29-428.000.
Davis, Thomas F., 4,234,631, Cl. 427-436.000.
Lawson, Gustaf R., 4,234,760, Cl. 174-138.00F.
Ampex Corporation: *See—*
Miller, Jerry W., 4,234,897, Cl. 360-45.000.
Amsted Industries Incorporated: *See—*
Ramon, Thomas; and Peck, Richard O., 4,233,745, Cl. 33-174.00L.
Rhodes, Cecil C.; and Kozar, Robert S., 4,234,429, Cl. 423-109.000.
Amtmann, Heribert, to Siemens Aktiengesellschaft. X-Ray diagnostic generator for operation with falling load. 4,234,793, Cl. 250-414.000.
Amundsen, Alan R.: *See—*
Hoeschele, James D.; and Amundsen, Alan R., 4,234,499, Cl. 260-429.00R.
Hoeschele, James D.; and Amundsen, Alan R., 4,234,500, Cl. 260-429.00R.
Analytical Products, Inc.: *See—*
Lucas, Flordeliza F.; and Smernoff, Ronald B., 4,234,317, Cl. 23-230.00B.
Anderie, Wolf, to Adidas Fabrique de Chaussures de Sport. Binding for securing a boot or shoe on a touring or cross-country ski. 4,234,208, Cl. 280-614.000.
Anderson, Richard D. Evaporative carburetor for combustion engines. 4,234,527, Cl. 261-102.000.
Anderson, Robert N.; and Parlee, Norman A. D., to Parlee-Anderson Corporation. Actinide nitride-fueled reactor and continuous method of operating the same. 4,234,383, Cl. 176-37.000.
Andersson, Clarence A., to United States of America, Energy. Structural silicon nitride materials containing rare earth oxides. 4,234,343, Cl. 106-73.200.
Andrea, Ralph W., III; Bennett, Leonard W.; and O'Connor, William W., to Motorola, Inc. Dual threshold repeater squelch circuit. 4,234,959, Cl. 455-35.000.
Andren, Carl F.: *See—*
Mosley, William H.; and Andren, Carl F., 4,234,966, Cl. 455-326.000.
Andrews, Philip H.: *See—*
Ballard, Norman E.; Cork, Frank; Andrews, Philip H.; and Chappell, Francis, 4,234,653, Cl. 428-328.000.
Angioletti, Attilio, to Industrie Pirelli, S.p.A. Floating breakwater. 4,234,266, Cl. 405-26.000.
Angold, John A.: *See—*
Adams, Michael B.; Angold, John A.; Morrison, Robert B.; and Zimmerman, Robert E., 4,233,909, Cl. 105-4.00R.
Anic, S.p.A.: *See—*
Vanoni, Pier L.; Serboli, Giancarlo; and De Marchi, Franco, 4,234,652, Cl. 428-296.000.
Anthony, Thomas R.; Cline, Harvey E.; Hartman, David K.; and Chang, Mike F., to General Electric Company. Guard ring for TGZM processing. 4,233,934, Cl. 118-500.000.
Antos, George J., to UOP Inc. Acidic multimetallic catalytic composite. 4,234,458, Cl. 252-441.000.
Antos, George J., to UOP Inc. Acidic multimetallic catalytic composite. 4,234,459, Cl. 252-441.000.
Aoshima, Terutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric rice cookers. 4,234,783, Cl. 219-441.000.
Apuzzo, Louis J., Jr.; and Acquarulo, Frank, Jr. Toothpaste dispenser having a slip clutch drive mechanism. 4,234,104, Cl. 222-94.000.
Arachi, John M.: *See—*
Reavill, Joseph A.; and Arachi, John M., 4,234,373, Cl. 156-382.000.
Arai, Hisaharu, to Aisan Industry Co., Ltd. Idle adjusting screw in carburetor. 4,234,524, Cl. 261-41.00D.
Arai, Yoshinobu: *See—*
Hayashi, Masaki; Ohuchida, Shuichi; and Arai, Yoshinobu, 4,234,597, Cl. 424-274.000.
Arakawa, Jun: *See—*
Tada, Sugihiko; Yanagihara, Kazuhiko; and Arakawa, Jun, 4,234,392, Cl. 203-91.000.
Arakawa, Tatsumi: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,234,679, Cl. 430-619.000.
Aratani, Matsuhiko: *See—*
Hashimoto, Masashi; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; and Hagiwara, Daijiro, 4,234,724, Cl. 544-90.000.
Arbman Development AB: *See—*
Friberg, Stig E.; and Roberts, Kelvin, 4,234,437, Cl. 252-62.510.
Archer, Richard L. Real estate sign support. 4,233,769, Cl. 40-607.000.
Arendsen, David L.: *See—*
Winn, Martin; Nordeen, Carl W.; and Arendsen, David L., 4,234,594, Cl. 424-273.00P.
Arendt, Ronald H.; and Rosolowski, Joseph H., to General Electric Company. Molten salt synthesis of modified alkali niobate powders. 4,234,436, Cl. 252-62.900.
Arendt, Ronald H.; and Rosolowski, Joseph H., to General Electric Company. Molten salt synthesis of alkali niobate powders. 4,234,557, Cl. 423-593.000.
Arendt, Ronald H.; and Rosolowski, Joseph H., to General Electric Company. Molten salt synthesis of orthorhombic lead metaniobate powder. 4,234,558, Cl. 423-593.000.
Argyle, Charles S.; Bamsey, Robert G.; and Millard, Gregory S. T., to Borg-Warner Corporation. Two fluid heat exchanger. 4,234,040, Cl. 165-164.000.
Ariga, Kazuo: *See—*
Teshima, Toru; Ariga, Kazuo; and Yoshida, Mitunari, 4,234,817, Cl. 313-493.000.
Arnold, Jonathan H. Safety harness for infants. 4,234,229, Cl. 297-467.000.
Arrow, Arthur: *See—*
Yost, David J.; Arrow, Arthur; and Konigsberg, Robert L., 4,234,142, Cl. 244-3.210.
Artex International Corporation: *See—*
Hryhorczuk, Dmytro, 4,233,767, Cl. 40-453.000.
Arvin Industries, Inc.: *See—*
Williams, Ronald S., 4,233,726, Cl. 29-507.000.
Arway, George W., to A. B. Dick Company. Remote ink valve. 4,234,885, Cl. 346-140.00R.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,234,679, Cl. 430-619.000.
Mishiro, Mashahiro; Nishikawa, Tokio; Ohashi, Shigeyasu; and Yokokawa, Yasuo, 4,234,431, Cl. 210-500.00M.
Yano, Nobumitsu; Fukinbara, Itaru; Yoshida, Koji; and Wakiyama, Yutaka, 4,234,619, Cl. 426-614.000.
Asahi Seimitsu Kabushiki Kaisha: *See—*
Koenuma, Masao; and Gibu, Yoshitaka, 4,233,751, Cl. 33-434.000.
Asai, Akira: *See—*
Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, 4,234,262, Cl. 400-175.000.
Asano, Masao: *See—*
Iwama, Hideaki; Koyama, Mikio; Asano, Masao; and Tsuda, Yasuo, 4,234,671, Cl. 430-213.000.
ASEA Aktiebolag: *See—*
Johansson, Birger, 4,234,864, Cl. 336-90.000.
Linderoth, Gustaf; and Wiberg, Karl-Gunnar, 4,234,624, Cl. 427-55.000.
Ashley-Butler, Inc.: *See—*
Watt, William E. R., 4,233,801, Cl. 53-453.000.
Astle, Brian; and Dischert, Robert A., to RCA Corporation. Automatic setup system for television cameras. 4,234,890, Cl. 358-10.000.
Astra Chemical Products AB: *See—*
Flodin, Per G. M.; Komlos, Peter G.; and Ranby, Bengt G., 4,234,565, Cl. 424-33.000.
Atherton, John H.; and Hodgkinson, Ian, to Imperial Chemical Industries Limited. Process and apparatus for the diazotization of amines. 4,234,478, Cl. 260-141.000.
Atkinson, William G., to Somerville Belkin Industries Limited. Method of rigidifying the tearing edge of a carton. 4,234,635, Cl. 428-80.000.
Atlantic Research Institute Limited: *See—*
Koller, Horst; Hartl, Alfons E.; and Kirchner, Gerhard, 4,234,516, Cl. 568-341.000.

Atlantic Richfield Company: *See*—
Burk, Emmett H., Jr.; Yoo, Jin S.; Sun, Jui-Yuan; and Karch, John A., 4,234,452, Cl. 252-419.000.
Wulfers, Thomas F., 4,234,434, Cl. 252-50.000.

ATO Chimie: *See*—
Catte, Raymond; Laputte, Robert; Moulies, Jean-Claude; and Lalaun, Jean-Pierre, 4,234,663, Cl. 428-517.000.
Deleens, Gerard; Guerin, Bernard; and Kern, Rene, 4,234,184, Cl. 273-235.00R.

Auberry, Horace, to Ro-Search, Inc. Footwear. 4,233,758, Cl. 36-3.00A.

Auergesellschaft GmbH: *See*—
Gronau, Manfred; Mascher, Werner; and Pampuch, Klaus, 4,233,971, Cl. 128-202.260.

Austin, Lowell W.: *See*—
Bird, Richard A.; and Austin, Lowell W., 4,234,406, Cl. 204-292.000.

Auston, David H.; Golovchenko, Jene A.; and Venkatesan, Thirumalai N. C., to Bell Telephone Laboratories, Incorporated. Dual wavelength optical annealing of materials. 4,234,356, Cl. 148-1.500.

Automated Production Systems Corporation: *See*—
Twyman, Noel H.; and Jenkins, Robert F., 4,234,283, Cl. 414-171.000.

Automation Designs, Inc.: *See*—
O'Neil, James P., 4,234,223, Cl. 294-88.000.

Autometric Incorporated: *See*—
Bunn, Robert F.; and Greve, Clifford W. (said Clifford W. Greve assors. to), 4,233,740, Cl. 33-1.00A.

Automobiles Peugeot: *See*—
Thiesce, Pierre, 4,234,205, Cl. 280-723.000.

Autovox: *See*—
Porchia, Eliseo, 4,234,139, Cl. 242-191.000.

Axel, Edwin. Container. 4,234,092, Cl. 206-523.000.

Azegami, Hitoshi: *See*—
Horigome, Eiji; Ota, Hiroshi; and Azegami, Hitoshi, 4,234,438, Cl. 252-62.540.

B. F. Goodrich Company, The: *See*—
Dickens, Elmer D., Jr., 4,234,472, Cl. 260-45.75M.
Kroenke, William J., 4,234,473, Cl. 260-45.75R.
Kroenke, William J., 4,234,474, Cl. 260-45.75R.
Lindsay, Geoffrey A., 4,234,703, Cl. 525-211.000.

Baatz, Henning; and Rittscher, Dieter, to Steag Kernenergie GmbH. Transport and storage receptacle for radioactive waste. 4,234,798, Cl. 250-506.000.

Babbs, Frederick W., to Cox of Watford Limited. Trim lock. 4,234,035, Cl. 160-392.000.

Bachmann, Willi: *See*—
Peter, Julius; Drossler, Heinz-Gunter; and Bachmann, Willi, 4,234,029, Cl. 152-354.0RB.

Bachner, Ernst, to Voest-Alpine Aktiengesellschaft. Arrangement at a continuous casting plant. 4,234,036, Cl. 164-420.000.

Bacsanyi, Thomas J.: *See*—
Orem, Donald E.; Holmes, Vernon P.; and Bacsanyi, Thomas J., 4,234,200, Cl. 279-2.00A.

Bade, Heribert: *See*—
Brunn, Horst; Bade, Heribert; and Hund, Franz, 4,234,348, Cl. 106-304.000.

Baekelmans, Paul: *See*—
Cuypers, Herve; and Baekelmans, Paul, 4,234,716, Cl. 528-483.000.

Bahl, Om P., to Research Corporation. Antigen for early pregnancy test and contraceptive vaccine. 4,234,561, Cl. 424-1.000.

Bailey, Alan; and Maggs, Frederick A. P., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Filter assemblies with layers of activated carbon fibrous cloth. 4,234,326, Cl. 55-278.000.

Bake, Earl A.; and Schoeneweis, E. Frederick, to Rockwell International Corporation. Plug valve construction. 4,234,011, Cl. 137-312.000.

Baker, Douglas W., to Leisure Lawn, Inc. Motorized dry fertilizer spreader. 4,234,131, Cl. 239-685.000.

Baker International Corporation: *See*—
Amancharla, Amareswar, 4,234,197, Cl. 277-124.000.
Roberts, William M., 4,234,043, Cl. 166-336.000.

Baker, John D. Clip storage. 4,234,085, Cl. 206-337.000.

Baker Perkins Holdings, Ltd.: *See*—
Mallinson, Leonard B., 4,233,901, Cl. 101-416.00A.

Baker, Robert K., to Potter Electric Signal Co. Plug-type switch. 4,234,879, Cl. 340-686.000.

Baldi, Michael O. Multi-directional marking device of the type to be used on pavement surfaces. 4,234,264, Cl. 404-11.000.

Balding, John V.: *See*—
Cieslak, Richard F.; Balding, John V.; and Lafrenz, Joseph, 4,234,964, Cl. 455-226.000.

Baldwin, John J.; and Ponticello, Gerald S., to Merck & Co., Inc. Thiosubstituted pyridines. 4,234,590, Cl. 424-263.000.

Balfanz, Fredrick J., to C-R-O, Inc. Programmed welding machine with weld head speed override. 4,234,777, Cl. 219-125.100.

Balinski, Henry A., to United States Gypsum Company. Method for stretching sheet metal and structural members formed therefrom. 4,233,833, Cl. 72-180.000.

Ballard, Norman E.; Cork, Frank; Andrews, Philip H.; and Chappell, Francis, to Rolls-Royce Limited. Protective coating. 4,234,653, Cl. 428-328.000.

Balzano, Lucien D.; and Lepretre, Marc V. A., to Bertin & Cie. Sealing device for hydraulic piston mechanism. 4,233,886, Cl. 92-86.500.

Bamsey, Robert G.: *See*—
Argyle, Charles S.; Bamsey, Robert G.; and Millard, Gregory S. T., 4,234,040, Cl. 165-164.000.

Bandag, Incorporated: *See*—
McDonough, John C.; Rary, James K.; Birth, Arden; and Kuzma, John J., Jr., 4,234,370, Cl. 156-95.000.

Bankes, Robert B.; and Grubb, John W., to Western Electric Company, Inc. Apparatus for simultaneous soldering of a plurality of devices. 4,234,118, Cl. 228-49.00R.

Barabas, Miklos F.; Cooke, William B.; Hardy, R. H. Stephen; and Verma, Arun, to Saskatchewan Power Corporation. Space heating using off-peak electric heat storage. 4,234,782, Cl. 219-365.000.

Barber-Colmar Company: *See*—
Patel, Dhiru B., 4,233,716, Cl. 28-187.000.

Barbieri, Joseph C.; and Wirth, Gary J., to W. H. Brady Co. Marker sleeve assembly. 4,234,090, Cl. 206-459.000.

Barlow, George J.: *See*—
Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., 4,234,919, Cl. 364-200.000.

Barnard, Ralph G.; and Taylor, Judson D., Jr., to Fieldcrest Mills, Inc. Napped bedding blanket. 4,233,701, Cl. 5-482.000.

Barner, Richard; and Schmid, Max, to Hoffmann-La Roche Inc. Intermediates in the synthesis of vitamin E. 4,234,490, Cl. 260-340.90R.

Barnes, Jocelyn T.; Hard, Chester A., III; Shelby, Billy L.; and Loch, Charles H., to International Telephone and Telegraph Corporation. Luminaire for residential roadway lighting. 4,234,912, Cl. 362-145.000.

Baron, Steve H. Protective headgear. 4,233,689, Cl. 2-413.000.

Barrett, Jack E. J., to A. E. Moore Company, Inc. Door operator system using counter circuit for determining limit positions. 4,234,833, Cl. 318-282.000.

Barrus, Gordon B.; and Matula, Jerry, to Printronix, Inc. Print hammer mechanism having dual pole pieces. 4,233,894, Cl. 101-93.040.

Barsted, Roger, to Coal Industry (Patents) Limited. Brake equipment. 4,234,060, Cl. 188-44.000.

Barth, Wayne E., to Pfizer Inc. Penicillanic acid 1,1-dioxides as β-lactamase inhibitors. 4,234,579, Cl. 424-246.000.

Bartl, Knut; Lill, Helmut; and Ziegenhorn, Joachim, to Boehringer Mannheim GmbH. Method and reagent for determining biologically active heparin in plasma. 4,234,682, Cl. 435-13.000.

Bartmann, Wilhelm: *See*—
Lattrell, Rudolf; Bartmann, Wilhelm; and Gerhards, Hermann, 4,234,584, Cl. 424-250.000.

Barton, Derek H. R.; and Hesse, Robert H., to Research Institute for Medicine & Chemistry Inc. Preparation of N,N-difluoroamines. 4,234,515, Cl. 564-114.000.

BASF Aktiengesellschaft: *See*—
Kuerten, Heribert; Nagel, Otto; and Zehner, Peter, 4,234,560, Cl. 423-659.000.
Toussaint, Herbert; Schroeder, Wolfgang; and Franzischka, Wolfgang, 4,234,727, Cl. 544-178.000.

BASF Wyandotte Corporation: *See*—
Hirozawa, Stanley T.; O'Brien, Edward F.; and Wilson, Joe C., 4,234,440, Cl. 252-76.000.

Bash, C. Malcolm, to Prince Manufacturing Co., Inc. Propulsion device for tennis balls and like spherical objects having an improved programmed discharge of the oscillatory type. 4,233,953, Cl. 124-56.000.

Bauer, Siegfried; and Boebel, Manfred, to Richard Wolf GmbH. Trocar sleeves having a ball valve. 4,233,982, Cl. 128-347.000.

Baxter Travenol Laboratories, Inc.: *See*—
Bayham, Edward L., 4,234,026, Cl. 150-8.000.
Desecki, Vince; and Filipowicz, Carl, 4,233,974, Cl. 128-215.000.
Schnell, William J., 4,234,428, Cl. 210-321.00B.
Strobl, Frederick P., Jr.; Winchell, David A.; and DeVroom, William A., 4,234,103, Cl. 222-83.500.

Bayer Aktiengesellschaft: *See*—
Brunn, Horst; Bade, Heribert; and Hund, Franz, 4,234,348, Cl. 106-304.000.
De Meyer, Herman; Doclo, Roland; and Seynaeve, Jan, 4,234,322, Cl. 55-18.000.
Fiedler, Franz, 4,234,477, Cl. 260-112.50R.
Harnisch, Horst; and Brack, Alfred, 4,234,488, Cl. 260-326.270.
Kramer, Erich, 4,234,480, Cl. 260-157.000.
La Spina, Andrea; Dietrich, Werner; and Schliebs, Reinhard, 4,234,694, Cl. 521-107.000.
Maurer, Fritz; Schroder, Rolf; Hammann, Ingeborg; Homeyer, Bernhard; and Frohberger, Paul-Ernst, 4,234,587, Cl. 424-251.000.
Mennicke, Winfried; Scholl, Walter; and Schundehutte, Karl-Heinz, 4,234,479, Cl. 260-145.00B.
Petersen, Uwe; Voss, Eckart; Metzger, Karl G.; and Stadler, Peter, 4,234,572, Cl. 424-180.000.
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,234,722, Cl. 544-58.400.
Sirrenberg, Wilhelm; Hammann, Ingeborg; Stendel, Wilhelm; and Klauke, Erich, 4,234,600, Cl. 424-310.000.

Bayham, Edward L., to Baxter Travenol Laboratories, Inc. Seal for flexible container. 4,234,026, Cl. 150-8.000.

Bayles, John J.: *See*—
Hollan, Mark E.; and Bayles, John J., 4,234,044, Cl. 169-14.000.

Bays, Marvin J. Protective device for automobiles. 4,234,222, Cl. 293-124.000.

Beale, Allan A.: *See*—
La Vance, Cecil N.; and Beale, Allan A., 4,234,924, Cl. 364-460.000.

Beasley, Robin D.; Hall, Trevor I.; and Morgon, Trevor A., to Elliott Brothers (London) Limited. Fiber optic communication system. 4,234,970, Cl. 455-607.000.

Beck, Christian A., to Pitney Bowes Inc. Hot roll fuser. 4,234,248, Cl. 355-3.0FU.

Beck, Gunther: *See—*
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,234,722, Cl. 544-58.400.

Beck, James C.; and Nielsen, Harrie W., to Singer Company, The. Optical illumination and distortion compensator. 4,234,891, Cl. 358-104.000.

Beckert, Alexander; and Dudziak, Ernst, to Reinhard Mohn GmbH. Process and apparatus for the production of book blocks. 4,234,178, Cl. 270-45.000.

Beebe, Ronald. Long distance telephone call security system. 4,234,764, Cl. 179-90.00D.

Beecham Group Limited: *See—*
Gardner, Derek V., 4,234,726, Cl. 544-151.000.

Beeche, Gregory L. Mobile suspension scaffold system. 4,234,055, Cl. 182-63.000.

Beeghly, Richard M.: *See—*
Van Nieuwal, John G.; Montgomery, Edward L.; and Beeghly, Richard M., 4,234,030, Cl. 152-354.00R.

Beeson, Justin L., to United States of America, Energy. Process for changing caking coals to noncaking coals. 4,234,319, Cl. 44-1.00R.

Beeson, Justin L.: *See—*
Duncan, Dennis A.; Beeson, Justin L.; Oberle, R. Donald; and Dirksen, Henry A., 4,234,407, Cl. 208-8.00R.

Beggs, Donald: *See—*
Scarlett, John C.; and Beggs, Donald, 4,234,169, Cl. 266-156.000.

Behle, Gunter R., to ACF Industries, Incorporated. Operating handle for bottom operated tank car valve having movable connection portion. 4,234,160, Cl. 251-144.000.

Behle, Gunter R.: *See—*
Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., 4,234,158, Cl. 251-144.000.
Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., 4,234,159, Cl. 251-144.000.

Beitz, Elden W. Carburetion in an internal combustion engine. 4,233,945, Cl. 123-585.000.

Belinko, Keith: *See—*
Nandi, Biswa N.; Belinko, Keith; Ciavaglia, Lynn A.; Pruden, Barry B.; and Denis, Jean-Marie D., 4,234,387, Cl. 201-23.000.

Bell Telephone Laboratories, Incorporated: *See—*
Auston, David H.; Golovchenko, Jene A.; and Venkatesan, Thirumalai N. C., 4,234,356, Cl. 148-1.500.
Bosik, Barry S., 4,234,762, Cl. 179-18.0HB.
Celler, George K.; Kimerling, Lionel C.; Leamy, Harry J.; Poate, John M.; and Rozgonyi, George A., 4,234,358, Cl. 148-1.500.

Bellaplast GmbH: *See—*
Heni, Wolfgang; and Wolf, Peter, 4,233,868, Cl. 83-126.000.

Bellus, Daniel: *See—*
Greuter, Hans; Martin, Pierre; and Bellus, Daniel, 4,234,517, Cl. 568-381.000.

Bender, Jeffrey R.: *See—*
Hamada, James H.; Bender, Jeffrey R.; Price, Earl T.; and Ingebretsen, Dennis A., 4,234,306, Cl. 433-55.000.

Bendix Autolite Corporation: *See—*
Romine, Donald J., 4,234,542, Cl. 422-98.000.

Bendix Corporation, The: *See—*
Harper, Patrick D., 4,234,903, Cl. 361-154.000.

Benezech, Jacques, to NOVI P.B. Societe Anonyme. Electrical condenser. 4,234,905, Cl. 361-307.000.

Benkwitt, Frances C.; and Sherif, Fawzy G., to Stauffer Chemical Company. Method and composition for inhibiting plaque. 4,234,568, Cl. 424-54.000.

Bennett, Barry: *See—*
Calhoun, Donald F.; and Bennett, Barry, 4,234,888, Cl. 357-45.000.

Bennett, Leonard W.: *See—*
Andrea, Ralph W., III; Bennett, Leonard W.; and O'Connor, William W., 4,234,959, Cl. 455-35.000.

Bennion, Douglas N.; and Wang, Su-Chee S., to University of California, The Regents of the. Battery and method for fabricating same. 4,234,667, Cl. 429-81.000.

Benno, Edward L.: *See—*
Platt, John R.; and Benno, Edward L., 4,234,082, Cl. 206-150.000.

Benson, Richard L.; Hill, Horace E.; and Soderberg, Mark S., to Boeing Company, The. Motor quick-change chuck system for tool having cylindrically shaped adapter portion. 4,234,277, Cl. 408-226.000.

Bente, Alfred; Dassler, Adolph, deceased; and by Henkel, Albert, legal representative, to Adidas Sportschuhfabriken Adi Dassler KG. Outsoles for sports shoes, particularly for use on artificial grass. 4,233,759, Cl. 36-59.00R.

Berardinelli, Frank M.: *See—*
Edelman, Robert; Berardinelli, Frank M.; and Wissbrun, Kurt F., 4,234,708, Cl. 525-444.000.

Berdan, Betty L.; and King, William M., to Gould Inc. Metal composites and laminates formed therefrom. 4,234,395, Cl. 204-12.000.

Berg, Josef, to Klockner-Humboldt-Deutz Aktiengesellschaft. Fuel injection pump, especially for internal combustion engines. 4,234,292, Cl. 417-214.000.

Berg, Odd. Lockable buckle for belts, straps and the like. 4,233,713, Cl. 24-191.000.

Berg, Ramon A.: *See—*
Bjorklund, Lowell L.; Berg, Ramon A.; and Friedland, George A., 4,233,880, Cl. 85-41.000.

Berge, Richard W. Golf bag club cover. 4,234,025, Cl. 150-1.50R.

Berger, Leo; and Scott, John W., to Hoffmann-La Roche Inc. Process of making a carbazole acetic acid. 4,234,487, Cl. 260-315.000.

Bergstrom, Gary, to DBX, Inc. Signal correction for electrical gain control systems. 4,234,804, Cl. 307-229.000.

Berkowitz, Irving M. Fabric hanger. 4,234,088, Cl. 206-408.000.

Bernauer, Karl; Link, Helmut; and Stohler, Harro, to Hoffmann-La Roche Inc. Antiandrogenic and schistosomicidal imidazolidine derivatives. 4,234,736, Cl. 548-314.000.

Berner, Godwin: *See—*
Rody, Jean; and Berner, Godwin, 4,234,728, Cl. 544-198.000.

Bernhard, Rudolf; and Bonjour, Hans, to Glasmatec AG. Apparatus for automatically sealing insulation glass panels. 4,234,372, Cl. 156-356.000.

Bernholdt, Harry F.: *See—*
Murphy, Robert E.; and Bernholdt, Harry F., 4,234,647, Cl. 428-220.000.

Berthold, Heinz; and Zimmer, Karl E., to Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft. Equipment for removing bulk material from a dump. 4,234,077, Cl. 198-712.000.

Berti, Marisa: *See—*
Cricchio, Renato; and Berti, Marisa, 4,234,485, Cl. 260-239.30P.

Bertin & Cie: *See—*
Balzano, Lucien D.; and Lepretre, Marc V. A., 4,233,886, Cl. 92-86.500.

Bester, Dennis R.: *See—*
Adderley, John A.; and Bester, Dennis R., 4,234,956, Cl. 375-38.000.

Bethlehem Steel Corporation: *See—*
Lynn, James B.; Homberg, Otto A.; and Burcaw, Kenneth R., Jr., 4,234,389, Cl. 201-30.000.
MacRae, Donald R.; and Gold, Richard G., 4,234,334, Cl. 75-10.00R.

Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., to Ralston Purina Company. Feed intake limiting fat for ruminants. 4,234,604, Cl. 426-2.000.

BFG Glassgroup: *See—*
Taupin, Pierre; Glineur, Michel; and Florean, Jean, 4,234,330, Cl. 65-21.000.

BICC Limited: *See—*
Edwards, Derek R.; and Gosling, Cyril H., 4,234,754, Cl. 174-14.00R.

Bichler, Josef: *See—*
Falbesaner, Egon; Bichler, Josef; and Wimmer, Eberhard, 4,234,422, Cl. 210-713.000.

Bickel, Hans: *See—*
Muller, Beat; Schneider, Peter; Peter, Heinrich; and Bickel, Hans, 4,234,578, Cl. 424-246.000.

Bickley, Robert H.; Briggs, Ronald C.; and Jost, Ronald C., to Motorola, Inc. Communication tuning system utilizing local oscillator frequency selection for maximum RF filter bandwidth and method thereof. 4,234,965, Cl. 455-285.000.

Bies, Sylvester W., to Stanley Works, The. Retractable blade knife. 4,233,734, Cl. 30-162.000.

Billenstein, Siegfried; Kukla, Bruno; and Stuhler, Herbert, to Hoechst Aktiengesellschaft. Process for the manufacture of fatty acid nitriles and glycerol from glycerides, especially from natural fats and oils. 4,234,509, Cl. 260-465.200.

Billet, Rene, to Societe Anonyme Francaise du Ferodo. Clutch release bearing. 4,234,067, Cl. 192-98.000.

Binks Manufacturing Company: *See—*
Lobach, James L.; Outteridge, David A. J.; and Colwell, Gary D., 4,234,290, Cl. 415-145.000.

Biotechnologie Aktiengesellschaft fur Emulsan: *See—*
Gutnick, David L.; Rosenberg, Eugene; and Shabtai, Yossef, 4,234,689, Cl. 435-101.000.

Birchall, William R.: *See—*
Frampton, Orville D.; and Birchall, William R., 4,234,748, Cl. 568-901.000.

Bird, Richard A.; and Austin, Lowell W., to National Steel Corporation. Nonplating cathode and method for producing same. 4,234,406, Cl. 204-292.000.

Birth, Arden: *See—*
McDonough, John C.; Rary, James K.; Birth, Arden; and Kuzma, John J., Jr., 4,234,370, Cl. 156-95.000.

Birum, Gail H.; and Jansen, Richard F., to Monsanto Company. 2-Chloroethyl phosphonate compositions. 4,234,696, Cl. 521-108.000.

Birzu, Ioan: *See—*
Voinea, Vasile; Catuneanu, Vasile; Birzu, Ioan; Teisanu, Eugen; Voinea, Maria I.; and Patrascu, Sorin, 4,234,794, Cl. 250-416.0TV.

Bishop, Richard N.: *See—*
Gray, Dorian R.; Bishop, Richard N.; and Timmons, William K., 4,233,933, Cl. 118-314.000.

Bisping, Hans-Jurgen. Implantable electrode. 4,233,992, Cl. 128-785.000.

Bisset, Claude O., to Hausler Scientific Instruments (Proprietary) Limited. Map reading device. 4,233,741, Cl. 33-1.00N.

Bitter, Istvan: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.

Bjorklund, Lowell L.; Berg, Ramon A.; and Friedland, George A., to Illinois Tool Works Inc. Stainless steel drill screw. 4,233,880, Cl. 85-41.000.

Blake, Donald F., to Coal Industry (Patents) Limited. Brake equipment. 4,234,063, Cl. 188-181.00T.

Blake, Stephen D.; and Lewis, Katherine J., to Xonics, Inc. Composite lamination film for electrophoretically toned images. 4,234,644, Cl. 428-204.000.

Blakeslee, Harry N., to American Can Company. Controlled dispersions of coatings. 4,233,932, Cl. 118-306.000.

Blazewicz, Andrzej: *See*—
Sedlaczek, Janusz; Blazewicz, Andrzej; Cyrulo, Jacek; Krutki, Marian; and Wozniak, Tadeusz, 4,234,234, Cl. 299-43.000.

Bock, Francis X., to Kollmorgen Technologies Corporation. Current limiter. 4,234,802, Cl. 328-171.000.

Bodinger, Donald C.: *See*—
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Boebel, Manfred: *See*—
Bauer, Siegfried; and Boebel, Manfred, 4,233,982, Cl. 128-347.000.

Boehme, Detlef R., to Varian Associates, Inc. Pulse damper. 4,234,427, Cl. 210-198.00C.

Boehringer Mannheim GmbH: *See*—
Bartl, Knut; Lill, Helmut; and Ziegenhorn, Joachim, 4,234,682, Cl. 435-13.000.
Winter, Werner; Friebe, Walter-Gunar; Kampe, Wolfgang; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,234,585, Cl. 424-250.000.

Boeing Company, The: *See*—
Benson, Richard L.; Hill, Horace E.; and Soderberg, Mark S., 4,234,277, Cl. 408-226.000.
Deminet, Czeslaw; and Oettel, Richard E., 4,234,351, Cl. 136-89.0EP.
Frank, Ed, 4,234,374, Cl. 156-459.000.

Boersma, Michael A. M.; and Sie, Swan T., to Shell Oil Company. Process for upgrading of Fischer-Tropsch products. 4,234,412, Cl. 208-80.000.

Boesen, Raymond J., to Stewart-Warner Corporation. Incandescent display system. 4,234,914, Cl. 362-240.000.

Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. 1-Trimethylsilylphenyl-3-mono- and -di-halobenzoyl-ureas, insecticidal compositions containing them and their use in controlling insect pests. 4,234,573, Cl. 424-184.000.

Bogner, Robert E.: *See*—
Eshraghian, Kamran; and Bogner, Robert E., 4,234,923, Cl. 364-436.000.

Bohm, Peter: *See*—
Weiler, Rolf; and Bohm, Peter, 4,233,884, Cl. 91-369.00B.

Bohn, Gerhard: *See*—
Gottzein, Eveline; Roche, Christian; and Bohn, Gerhard, 4,233,905, Cl. 104-281.000.

Boiko, Mikhail I.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.

Boissicat, Claude M., to Contrel Corporation. Dip-handling apparatus. 4,234,418, Cl. 209-542.000.

Bolt Associates, Inc.: *See*—
Chelminski, Stephen V., 4,234,052, Cl. 181-120.000.

Bonar, Thomas G. Self-closing hinge apparatus. 4,233,708, Cl. 16-152.000.

Bondar, Petr G.; and Zavadskaya, Anna S. Process for activating a catalyst. 4,234,462, Cl. 252-463.000.

Boniface, John A.; Field, Ronald E.; Gwynn, Eric C.; and Turner, William L. A., to Singer Company, The. Vehicle simulator optical pick-up head. 4,233,755, Cl. 35-11.00R.

Bonjour, Hans: *See*—
Bernhard, Rudolf; and Bonjour, Hans, 4,234,372, Cl. 156-356.000.

Boop, Gene T., to Sie, Inc. Selective fire perforating gun switch. 4,234,768, Cl. 200-52.00R.

Booth, John L.; and Rittmaster, Peter A., to International Honeycomb Corporation, by said John L. Booth. Packaging machine. 4,233,802, Cl. 53-475.000.

Borchard, Heinz, to Teldec Telefunken-Decca Schallplatten GmbH. Method for producing an information carrier disc. 4,234,394, Cl. 204-5.000.

Borders, Donald B.: *See*—
Tresner, Homer D.; Fantini, Amedeo A.; Borders, Donald B.; and McGahren, William J., 4,234,717, Cl. 536-17.00R.

Borg-Warner Corporation: *See*—
Argyle, Charles S.; Bamsey, Robert G.; and Millard, Gregory S. T., 4,234,040, Cl. 165-164.000.
Guzy, Raymond L., 4,234,758, Cl. 174-84.00R.

Borom, Marcus P.; and Schultz, John, Jr., to General Electric Company. Magnesia insulated heating elements and method of making the same. 4,234,786, Cl. 219-544.000.

Bosik, Barry S., to Bell Telephone Laboratories, Incorporated. Ring trip detector circuit. 4,234,762, Cl. 179-18.0HB.

Bostwick, Robert: *See*—
Amemba1, Amar; Bostwick, Robert; and Shaw, Richard G., 4,234,656, Cl. 428-379.000.

Botros, Raouf; and Riggle, Ivan E., to American Color & Chemical Corporation. N-(3-Chloro-4-[2,6-dichloro-4-nitrophenyl)azo]-2-methyl phenyl)-β-alanine, methyl ester. 4,234,483, Cl. 260-207.100.

Bottger, Klaus; Muller, Dieter; Schmekel, Karl-W.; and Tausch, Walter, to Carl Zeiss-Stiftung. Apparatus for the simultaneous photometric determination of a plurality of elements in a liquid sample. 4,234,252, Cl. 356-73.000.

Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, to Bristol-Myers Company. Process for the preparation of the crystalline monohydrate of 7-[D-amino-(p-hydroxyphenyl]acetamido)-3-methyl-3-cephen-4-carboxylic acid. 4,234,721, Cl. 544-30.000.

Bowen, Terry P.; Hoover, Charles D.; Ferdon, Gilbert D.; and Harwood, Robert G., to AMP Incorporated. Method of accurately positioning fiber cables within ferrules. 4,233,724, Cl. 29-428.000.

Bowman, Noel T.: *See*—
King, Christopher D.; and Bowman, Noel T., 4,234,839, Cl. 320-36.000.

Bowman, Noel Trevor: *See*—
King, Christopher D.; and Bowman, Noel T., 4,234,839, Cl. 320-36.000.

Brack, Alfred: *See*—
Harnisch, Horst; and Brack, Alfred, 4,234,488, Cl. 260-326.270.

Brackmann, Warren A.; and Dilanni, Daniel, to Rothmans of Pall Mall Canada Limited. Cutting leaf tobacco. 4,233,996, Cl. 131-140.00R.

Brad Ragan, Incorporated: *See*—
Christman, Harold E., 4,234,371, Cl. 156-96.000.

Bradley, John J.: *See*—
Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., 4,234,919, Cl. 364-200.000.

Bradley, Robert C.: *See*—
Peer, George J.; and Bradley, Robert C., 4,234,430, Cl. 210-489.000.

Bradley, Stevan D.: *See*—
Tracey, Robert J.; Bradley, Stevan D.; and Hartley, William F., 4,234,957, Cl. 375-86.000.

Bradley, William E.; Klatt, William M.; Kuyava, Charles C.; and Dreher, Robert D., to American Medical Systems, Inc. Urethral catheter puller. 4,233,991, Cl. 128-733.000.

Brandenberger, Albert: *See*—
Gehring, Rudolf; and Brandenberger, Albert, 4,234,138, Cl. 242-131.100.

Brandenstein, Manfred: *See*—
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,233,855, Cl. 74-396.000.

Brandoli, Luigi. Structure for a motor vehicle seat. 4,234,173, Cl. 267-103.000.

Brandt, Gert M.; and Hansen, Soren R., to Aktieselskabet MEC Mekanisk Elektrisk Compagni af 1975. Electrical switch having a floating bridge member. 4,234,769, Cl. 200-67.0DB.

Brannan, James R., to Diamond Shamrock Corporation. Method for recovery and use of zinc from a leach solution. 4,234,401, Cl. 204-149.000.

Branovich, Louis E.: *See*—
DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., 4,234,622, Cl. 427-45.100.

Brantingham, George L.: *See*—
Wiggins, Richard H., Jr.; and Brantingham, George L., 4,234,761, Cl. 179-1.0SM.

Braun Aktiengesellschaft: *See*—
Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, 4,234,836, Cl. 318-480.000.

Bredeweg, Roger L.; and Sitek, George J., to Leco Corporation. Combustion chamber cleaning apparatus. 4,234,541, Cl. 422-78.000.

Breining, Tibor: *See*—
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.

Breiter, Manfred W.: *See*—
Park, Dong-Sil; Breiter, Manfred W.; and King, Rendall N., 4,234,668, Cl. 429-163.000.

Bremer, Noel J.: *See*—
Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., 4,234,461, Cl. 252-462.000.

Brennen, Michael B.; and Gyugyi, Laszlo, to Westinghouse Electric Corp. Voltage regulator and flicker compensator. 4,234,842, Cl. 323-119.000.

Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Round-about game apparatus. 4,234,181, Cl. 273-1.00R.

Brewer, Douglas M.; Mawson, Alan; and Carter, William S., to Nairn Floors Limited. Wall and floor coverings comprising a substrate formed from comminuted, recycled, fiber-reinforced foam-containing sheets. 4,234,366, Cl. 156-79.000.

Bridgestone Tire Co., Ltd.: *See*—
Yukuta, Toshio; Ishiwaka, Takumi; and Usui, Kiyoshi, 4,234,695, Cl. 521-107.000.

Briggs, Ronald C.: *See*—
Bickley, Robert H.; Briggs, Ronald C.; and Jost, Ronald C., 4,234,965, Cl. 455-285.000.

Brinkley, Robert G., to Polaroid Corporation. Process for preparing metal phthalocyanine compounds. 4,234,486, Cl. 260-314.500.

Brissey, David C.: *See*—
Titone, Joseph R.; Brissey, David C.; and Carlson, Denny L., 4,234,007, Cl. 137-101.190.

Bristol-Myers Company: *See*—
Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, 4,234,721, Cl. 544-30.000.
Kavadias, Gerry, 4,234,731, Cl. 46-97.000.

British Industrial Plastics Limited: *See*—
Inverarity, George; and Ogden, Dennis H., 4,234,698, Cl. 521-188.000.
British Petroleum Company Limited, The: *See*—
Clinton, John S., 4,233,924, Cl. 114-259.000.
Brittain, John E.: *See*—
Hersom, Albert C.; Brittain, John E.; and Darlington, Raymond, 4,234,537, Cl. 422-26.000.
Bromberg, Howard M. Slide calculator. 4,233,768, Cl. 40-489.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, 4,234,262, Cl. 400-175.000.
Brouard, Claude M. H. E.; and Stiot, Jean-Pierre H., to Produits Chimiques Ugine Kuhlmann Service Propriete Industrielle. Substituted 3-carbalkoxy 4-alkylamino-azobenzene compound as disperse dyestuffs for synthetic fibers. 4,234,482, Cl. 260-187.000.
Brown, David, to Halcon Research and Development Corp. Process for preparing cellulose acetate. 4,234,718, Cl. 536-69.000.
Brown, Joe B.; Thompson, Louis I.; and Mishanec, Stephen P., to Roberts Corporation. Mold conveyor drive assembly. 4,233,907, Cl. 104-172.00B.
Brown, Michael J., to GAF Corporation. Phenoxybenzylphosphonium salt pesticides. 4,234,576, Cl. 424-211.000.
Brown, Thomas H.; and Ife, Robert J., to Smith Kline & French Laboratories Limited. Pyrimidine compounds. 4,234,588, Cl. 424-251.000.
Browne, Sidney. Telephone station carrier system. 4,234,950, Cl. 370-71.000.
Browse, Edward, to Inventec Licensing BV. Seats for children. 4,234,152, Cl. 248-415.000.
Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., to Honeywell Information Systems Inc. Intersystem communication link. 4,234,919, Cl. 364-200.000.
Bruckner Apparatebau GmbH: *See*—
Schuierer, Manfred, 4,234,311, Cl. 8-138.000.
Brunn, Horst; Bade, Heribert; and Hund, Franz, to Bayer Aktiengesellschaft. Process for the production of iron oxide red pigments. 4,234,348, Cl. 106-304.000.
Bruns, James A., to Uniroyal, Inc. Mechanical power transmission system. 4,233,852, Cl. 474-153.000.
Bryant, Robert T.: *See*—
Wallace, Clifford G.; von Isenburg, Carl; Chun, Michael D.; Holmberg, Kenneth G.; and Bryant, Robert T., 4,234,926, Cl. 364-551.000.
Buchman, Russell, to Diamond Shamrock Corporation. Method of preparing ketoxime carbamates. 4,234,514, Cl. 564-255.000.
Buckman, John D., to Buckman Laboratories, Inc. Dialkylamino-N,N-bis(phosphonoalkylene)alkylamines and use in aqueous systems as precipitation and corrosion inhibitors. 4,234,511, Cl. 260-502.500.
Buckman Laboratories, Inc.: *See*—
Buckman, John D., 4,234,511, Cl. 260-502.500.
Johnston, Titus M., 4,234,665, Cl. 428-541.000.
Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., to Research Corporation. Application of protein-protein interaction as an assay for the detection of cancer. 4,234,476, Cl. 260-112.00R.
Budevska, Hrisanta N.: *See*—
Moshtev, Rafail V.; Budevska, Hrisanta N.; Ivanova, Latinka T.; and Yankova, Radka D., 4,234,623, Cl. 427-54.100.
Bueding, Ernest; Werbel, Leslie M.; and Worth, Donald F., to Edna McConnell Clark Foundation. 2-Chloro-4-(4-lower alkyl-1-piperazinyl)benzenemethanol, N^{10}-oxides and methods for their preparation. 4,234,583, Cl. 424-250.000.
Bugarcic, Helmut, to Waggon Union GmbH. Asymmetrical subway vehicle. 4,233,904, Cl. 104-138.00R.
Bungard, Stephen J.; and Byrom, David, to Imperial Chemical Industries Limited. β-Galactosidase. 4,234,687, Cl. 435-99.000.
Bunn, Robert F.; and Greve, Clifford W., to Autometric Incorporated, by said Clifford W. Greve. Photogrammetric plotter and constraint free drive system therefore. 4,233,740, Cl. 33-1.00A.
Burcaw, Kenneth R., Jr.: *See*—
Lynn, James B.; Homberg, Otto A.; and Burcaw, Kenneth R., Jr., 4,234,389, Cl. 201-30.000.
Burenkov, Nikolai A.; Ioganson, Rikhard A.; Perchenok, Mark B.; Kuprianov, Alexandr V.; Chegodaev, Evgeny V.; and Chulin, Valentin I. Electromagnetic brake. 4,234,809, Cl. 310-105.000.
Burger, Norman D., to Mardesich, Nicholas A., a part interest. Method and apparatus for inserting a flexible inner container within a rigid outer container. 4,233,725, Cl. 29-451.000.
Burk, Emmett H., Jr.; Yoo, Jin S.; Sun, Jui-Yuan; and Karch, John A., to Atlantic Richfield Company. High pressure oxygen aqueous phase catalyst demetallization. 4,234,452, Cl. 252-419.000.
Burley, Joseph W.: *See*—
Groenenboom, Cornelis J.; Huysmans, Willem G. B.; Burley, Joseph W.; Hutton, Ronald E.; and Jolley, Michael R. J., 4,234,501, Cl. 260-429.700.
Burnell, Laurence K.; Hyde, James D.; Kolak, Nicholas P.; and Gibbs, Richard E., to Nox Research Corp. Control of nitrogen oxides from stationary source effluents. 4,234,548, Cl. 423-235.000.
Burroughs Corporation: *See*—
Chu, Ke-Chiang; and Sharp, Richard S., 4,234,918, Cl. 364-200.000.
Burroughs Wellcome Co.: *See*—
Faulkner, Douglas E., 4,234,313, Cl. 23-230.00B.
Busacca, Guido; Luparello, Pietro; Marranca, Lucio; and Sanfilippo, Michele, to Societa Italiana Telecomunicazioni Siemens S.p.A. System for linearly tuning a microwave oscillator. 4,234,855, Cl. 331-90.000.
Bussey, Harry, Jr. Foamable thermoplastic stick and foamed element made therefrom. 4,234,657, Cl. 428-400.000.
Butin, Henri, to Thomson-CSF. Threshold device for distinguishing the white level from the black level in an input signal delivered by a reading head for analyzing a document. 4,234,867, Cl. 340-146.3AG.
Byrom, David: *See*—
Bungard, Stephen J.; and Byrom, David, 4,234,687, Cl. 435-99.000.
C. A. Weidmuller KG: *See*—
Wilmes, Manfred; Obst, Rudiger; and Kretzschmar, Wolfgang, 4,234,239, Cl. 339-198.0GA.
C-R-O, Inc.: *See*—
Balfanz, Fredrick J., 4,234,777, Cl. 219-125.100.
Cacho, Gibson C. Speaker assembly. 4,234,766, Cl. 179-115.50R.
Caille, Gilles, to Societe Anonyme Expandet. Distributing machine for placing stored objects on grill stands. 4,233,799, Cl. 53-154.000.
Cairns, Edward C.: *See*—
Welland, Frederick J., Jr.; and Cairns, Edward C., 4,234,941, Cl. 367-116.000.
Cal Pak Industries, Inc.: *See*—
Pastore, Ronald, 4,234,101, Cl. 221-241.000.
Calbiochem-Behring Corp.: *See*—
Hevey, Richard C.; Malmros, Mark K.; and Petko, Wayne W., 4,234,680, Cl. 435-7.000.
Calhoun, Donald F.; and Bennett, Barry, to Hughes Aircraft Company. Multi-level large scale complex integrated circuit having functional interconnected circuit routed to master patterns. 4,234,888, Cl. 357-45.000.
Calspan Corporation: *See*—
Stoddard, Frank J., 4,234,857, Cl. 331-94.50G.
Camilleri, Thomas M. Liner for deck chute. 4,234,182, Cl. 273-42.00R.
Campbell, Michael F.: *See*—
Howard, Paulette A.; Campbell, Michael F.; and Zollinger, David T., 4,234,620, Cl. 426-656.000.
Campbell, Russell, to Canada, Her Majesty the Queen in right of. Interleaved binary coded signal translation device. 4,234,930, Cl. 364-724.000.
Canada, Her Majesty the Queen in right of: *See*—
Campbell, Russell, 4,234,930, Cl. 364-724.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See*—
Nandi, Biswa N.; Belinko, Keith; Ciavaglia, Lynn A.; Pruden, Barry B.; and Denis, Jean-Marie D., 4,234,387, Cl. 201-23.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Royce, John H.; Rowarth, John E.; and Walker, John, 4,233,780, Cl. 49-485.000.
Sewell, Richard B. H.; and Kidd, Derek J., 4,234,637, Cl. 428-131.000.
Canadian Patents and Development Limited: *See*—
Chow, Suezone, 4,234,658, Cl. 428-403.000.
Canale, Albert S.: *See*—
Canale, Ralph D.; and Canale, Albert S., 4,234,443, Cl. 252-135.000.
Canale, Michael A.: *See*—
Canale, Ralph D.; and Canale, Albert S., 4,234,443, Cl. 252-135.000.
Canale, Ralph D.; and Canale, Albert S., to Canale, Michael A. Composition and a method useful for making a fountain solution for lithographic printing operations. 4,234,443, Cl. 252-135.000.
Canfield, Sheldon A., to Owens-Corning Fiberglas Corporation. Apparatus for measuring tension in a linear material. 4,233,837, Cl. 73-144.000.
Cannon, Lee E., to Dana Corporation. Stepping motor control circuit. 4,234,830, Cl. 318-39.000.
Canon Kabushiki Kaisha: *See*—
Kanaiwa, Kiyoshi; and Matsumoto, Kozo, 4,234,931, Cl. 364-900.000.
Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, 4,234,305, Cl. 432-59.000.
Sato, Hiroshi; and Yamamoto, Hironori, 4,234,175, Cl. 269-73.000.
Canyon Corporation: *See*—
Tada, Tetsuya; and Amari, Masaharu, 4,234,127, Cl. 239-333.000.
Carabateas, Philip M.: *See*—
Diana, Guy D.; and Carabateas, Philip M., 4,234,725, Cl. 544-140.000.
CarboMedics, Inc.: *See*—
Akins, Robert J., 4,233,690, Cl. 3-1.500.
Cardono, Angelo. Apparatus for aiding the cutting of a rubber mold. 4,234,174, Cl. 269-37.000.
Cardrei Corporation: *See*—
Dreisinger, Thomas E.; and Carson, William L., 4,233,844, Cl. 73-379.000.
Carl Zeiss-Stiftung: *See*—
Bottger, Klaus; Muller, Dieter; Schmekel, Karl-W.; and Tausch, Walter, 4,234,252, Cl. 356-73.000.
Carlisle Corporation: *See*—
Harlow, Norman R., 4,234,759, Cl. 174-104.000.
Carlsen, George D., II, to EVC, Inc. Circuit and method for paralleling power transistors. 4,234,805, Cl. 307-254.000.
Carlson, Denny L.: *See*—
Titone, Joseph R.; Brissey, David C.; and Carlson, Denny L., 4,234,007, Cl. 137-101.190.
Carnaby, Garth A., to Wool Research Organization of New Zealand (Inc.). Needle stitching. 4,233,917, Cl. 112-222.000.
Carrier, Vernon J. Wall fastener structure. 4,233,881, Cl. 85-81.000.

Carson, William L.: *See—*
Dreisinger, Thomas E.; and Carson, William L., 4,233,844, Cl. 73-379.000.

Carter, Harold V.; and Durfee, Frederick G., to Process Analyzers, Inc. Flame photometric detector adapted for use in hydrocarbon streams. 4,234,257, Cl. 356-417.000.

Carter, William S.: *See—*
Brewer, Douglas M.; Mawson, Alan; and Carter, William S., 4,234,366, Cl. 156-79.000.

CAS Products, Inc.: *See—*
Fairbanks, Everitt E., 4,233,965, Cl. 128-1.500.

Casad, Edward F.; and Casad, Thomas R., to Ajax Machine & Welding Co. Safety release for water skiing tow line. 4,233,923, Cl. 114-253.000.

Casad, Thomas R.: *See—*
Casad, Edward F.; and Casad, Thomas R., 4,233,923, Cl. 114-253.000.

Caterpillar Tractor Co.: *See—*
Martin, Gary G.; and Smith, James C., 4,234,198, Cl. 277-145.000.
McGee, Mary Ann C., 4,234,908, Cl. 362-66.000.

Catte, Raymond; Laputte, Robert; Moulies, Jean-Claude; and Lalaun, Jean-Pierre, to ATO Chimie. Thermoplastic multi-layer foil structure. 4,234,663, Cl. 428-517.000.

Catuneanu, Vasile: *See—*
Voinea, Vasile; Catuneanu, Vasile; Birzu, Ioan; Teisanu, Eugen; Voinea, Maria I.; and Patrascu, Sorin, 4,234,794, Cl. 250-416.0TV.

Caugant, Jean; and Dale, Jacques, to Compagnie Generale de Radiologie. Film changer for X-ray apparatus. 4,234,796, Cl. 250-468.000.

Cederblad, Claes A., to Spanset Inter AG. Clutched winch. 4,234,166, Cl. 24-68.0CD.

Celanese Corporation: *See—*
Edelman, Robert; Berardinelli, Frank M.; and Wissbrun, Kurt F., 4,234,708, Cl. 525-444.000.
Miano, Ralph R.; and Keith, Charles H., 4,233,993, Cl. 131-2.000.

Celler, George K.; Kimerling, Lionel C.; Leamy, Harry J.; Poate, John M.; and Rozgonyi, George A., to Western Electric Company, Inc.; and Bell Telephone Laboratories, Incorporated. Patterned epitaxial regrowth using overlapping pulsed irradiation. 4,234,358, Cl. 148-1.500.

Centerline Steering Safety Axle Corporation, The: *See—*
Inbody, Melvin R., 4,234,236, Cl. 301-6.00W.

Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych Komag: *See—*
Sedlaczek, Janusz; Blazewicz, Andrzej; Cyrulo, Jacek; Krutki, Marian; and Wozniak, Tadeusz, 4,234,234, Cl. 299-43.000.

Chabot, Jean-Marie, to Les Industries Procinciales Ltee. Container lid having venting means. 4,234,100, Cl. 220-306.000.

Champion International Corporation: *See—*
Gingerich, David L.; and Cohn, Robert, 4,233,931, Cl. 118-239.000.
Lillibridge, Harold R., 4,234,122, Cl. 229-77.000.

Champlin, Charles L., to Packaging Corporation of America. Carrier for a plurality of articles. 4,234,081, Cl. 206-147.000.

Chang, Mike F.: *See—*
Anthony, Thomas R.; Cline, Harvey E.; Hartman, David K.; and Chang, Mike F., 4,233,934, Cl. 118-500.000.

Chapin, John S. Multi-duct muffler. 4,234,054, Cl. 181-252.000.

Chappell, Francis: *See—*
Ballard, Norman E.; Cork, Frank; Andrews, Philip H.; and Chappell, Francis, 4,234,653, Cl. 428-328.000.

Charette, Ray O.; and Yates, Elmer J., to United States of America, Air Force. Base vent assembly for entry space vehicles. 4,234,144, Cl. 244-160.000.

Charlot, Lincoln H., to National Computer Sign Company. Ballast circuit for low pressure gas discharge lamp. 4,234,823, Cl. 315-224.000.

Chegodaev, Evgeny V.: *See—*
Burenkov, Nikolai A.; Ioganson, Rikhard A.; Perchenok, Mark B.; Kuprianov, Alexandr V.; Chegodaev, Evgeny V.; and Chulin, Valentin I., 4,234,809, Cl. 310-105.000.

Chelminski, Stephen V., to Bolt Associates, Inc. Method and apparatus for generating seismic impulses using high pressure water pump as the energizing source. 4,234,052, Cl. 181-120.000.

Chem-Crete Corporation: *See—*
Latta, Laurence, Jr.; and Leonard, John B., Jr., 4,234,346, Cl. 106-281.00R.

Chen, Hsing-Yao; and Hughes, Richard H., to RCA Corporation. Electron gun with astigmatic flare-reducing beam forming region. 4,234,814, Cl. 313-412.000.

Cheng, Sheng-Hsiung. Adjustable surface temperature detector. 4,233,750, Cl. 337-374.000.

Chevron Research Company: *See—*
Donaghey, Lee F., 4,234,353, Cl. 136-258.000.
Lilburn, Jennifer E., 4,234,321, Cl. 44-72.000.

Chia, Enrique C.; and Schoerner, Roger J., to Southwire Company. Method for manufacturing an aluminum alloy electrical conductor. 4,234,359, Cl. 148-2.000.

Chihara, Takeshi; and Kono, Masanori, to Delta Kogyo Co., Ltd.; and Toyo Kogyo Co., Ltd. Device for mounting a mirror on an automobile panel. 4,234,153, Cl. 248-475.00B.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.

Chisso Corporation: *See—*
Kunimune, Kohichi; Hane, Teruaki; Inadomi, Seigo; and Furukawa, Yasuhiko, 4,234,655, Cl. 428-374.000.

Chodnekar, Madhukar S.; Loeliger, Peter; Schwieter, Ulrich; Pfiffner, Albert; Suchy, Milos; and Zurflun, Rene, to Hoffmann-La Roche Inc. Phenylcarbamates. 4,234,598, Cl. 424-278.000.

Chow, Suezone, to Canadian Patents and Development Limited. Wood composites with foliage adhesive. 4,234,658, Cl. 428-403.000.

Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., to Merck & Co., Inc. 3-(2-Aminoethylthio)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid. 4,234,596, Cl. 424-274.000.

Christensen, Inc.: *See—*
Rowley, David S., 4,234,048, Cl. 175-329.000.

Christman, Harold E., to Brad Ragan, Incorporated. Method and apparatus for applying a circumferential tread to a tire carcass. 4,234,371, Cl. 156-96.000.

Christman, William J., to UOP Inc. Liquid-liquid extraction apparatus. 4,234,544, Cl. 422-256.000.

Chu, Ke-Chiang; and Sharp, Richard S., to Burroughs Corporation. Time-shared, multi-phase memory system with error checking and data correcting. 4,234,918, Cl. 364-200.000.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Takahashi, Hironobu; Honda, Masamitus; Murakami, Yasushi; and Iwane, Yoshitaka, 4,234,582, Cl. 424-249.000.

Chulin, Valentin I.: *See—*
Burenkov, Nikolai A.; Ioganson, Rikhard A.; Perchenok, Mark B.; Kuprianov, Alexandr V.; Chegodaev, Evgeny V.; and Chulin, Valentin I., 4,234,809, Cl. 310-105.000.

Chun, Michael D.: *See—*
Wallace, Clifford G.; von Isenburg, Carl; Chun, Michael D.; Holmberg, Kenneth G.; and Bryant, Robert T., 4,234,926, Cl. 364-551.000.

Chunn, Robert E. Educational playing cards. 4,234,189, Cl 273-299.000.

Ciavaglia, Lynn A.: *See—*
Nandi, Biswa N.; Belinko, Keith; Ciavaglia, Lynn A.; Pruden, Barry B.; and Denis, Jean-Marie D., 4,234,387, Cl. 201-23.000.

Ciba-Geigy AG: *See—*
Postle, Stephen R., 4,234,677, Cl. 430-518.000.

Ciba-Geigy Corporation: *See—*
Boger, Manfred; and Drabek, Jozef, 4,234,573, Cl. 424-184.000.
Greuter, Hans; Martin, Pierre; and Bellus, Daniel, 4,234,517, Cl. 568-381.000.
Hicstand, Armin; and Rohringer, Peter, 4,234,341, Cl. 106-18.220.
Karrer, Friedrich, 4,234,734, Cl. 546-188.000.
Muller, Beat; Schneider, Peter; Peter, Heinrich; and Bickel, Hans, 4,234,578, Cl. 424-246.000.
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,234,723, Cl. 544-64.000.
Rody, Jean; and Rasberger, Michael, 4,234,699, Cl. 525-55.000.
Rody, Jean; and Rasberger, Michael, 4,234,700, Cl. 525-55.000.
Rody, Jean; and Nikles, Erwin, 4,234,707, Cl. 525-437.000.
Rody, Jean; and Berner, Godwin, 4,234,728, Cl. 544-198.000.

Ciccarello, Richard. Cutter-vacuum-plunger applicator. 4,234,375, Cl. 156-530.000.

Cieslak, Richard F.; Balding, John V.; and Lafrenz, Joseph, to Industrial Electronics Service Company. Radio receiver monitoring and testing apparatus. 4,234,964, Cl. 455-226.000.

Citizen Watch Co., Ltd.: *See—*
Hishida, Hiroshi; Nakayama, Toshihiko; Koyama, Isao; and Wakabayashi, Hisao, 4,234,811, Cl. 310-348.000.
Kunita, Masao; Mizutani, Nagao; and Kurihara, Toshio, 4,234,260, Cl. 400-219.300.
Maekawa, Yasuo; Sekiguchi, Tsunetoshi; Waki, Masahiko; Koide, Hiroshi; Watanabe, Kisuke; Matsumura, Osamu; and Yamagata, Hisao, 4,234,948, Cl. 368-291.000.
Matsumoto, Masataka, 4,234,947, Cl. 368-287.000.
Nomura, Yasushi; Komatsu, Yuzo; and Morokawa, Shigeru, 4,234,945, Cl. 368-75.000.
Takahashi, Kotaro, 4,234,946, Cl. 368-76.000.
Teramoto, Kazuo; Watanabe, Minoru; and Matumura, Tetuo, 4,234,943, Cl. 368-35.000.

Clabburn, Robin J. T.; and Penneck, Richard J., to Raychem Limited. Resilient connector. 4,233,731, Cl. 29-859.000.

Clarion Co., Ltd.: *See—*
Mochizuki, Hidetoshi; and Okada, Masataka, 4,234,892, Cl. 358-174.000.

Cleaveland, Charles M.; and Kowalik, Peter M., to Cleaveland/Price Enterprises, Inc. Shaft-clamping device. 4,234,147, Cl. 248-74.00R.

Cleaveland/Price Enterprises, Inc.: *See—*
Cleaveland, Charles M.; and Kowalik, Peter M., 4,234,147, Cl. 248-74.00R.

Clement, Michael H. Method and apparatus for mounting an engine block boring machine. 4,234,275, Cl. 408-19.000.

Clifft, Dale L., to LCG, Inc. Tool for blowing insulation into an existing wall structure having a brick exterior. 4,233,788, Cl. 52-127.000.

Cline, Harvey E.: *See—*
Anthony, Thomas R.; Cline, Harvey E.; Hartman, David K.; and Chang, Mike F., 4,233,934, Cl. 118-500.000.

Clinton, John S., to British Petroleum Company Limited, The. Underwater craft launch tube. 4,233,924, Cl. 114-259.000.

Clokie, Andrew K., to Greenbat Limited. Circular looms. 4,234,021, Cl. 139-371.000.

Clutter, Melvin E., to A. B. Chance Company. Electrical insulator and conductor cover. 4,234,753, Cl. 174-5.00R.

Clyne, John C.; Steel, William G.; and Nicholls, Ronald T. Cleaning device. 4,233,703, Cl. 15-53.00B.

Coal Industry (Patents) Limited: *See—*
Barsted, Roger, 4,234,060, Cl. 188-44.000.
Blake, Donald F., 4,234,063, Cl. 188-181.00T.
Kormendy, Miltiades, 4,234,163, Cl. 254-108.000.

Coast Radar and Communications Ltd.: *See—*
Welland, Frederick J., Jr.; and Cairns, Edward C., 4,234,941, Cl. 367-116.000.

Coates, George R., to Schlumberger Technology Corporation. Apparatus and method for determining characteristics of subsurface formations. 4,233,839, Cl. 73-152.000.

Cognacq, Jean C.; and Lacrampe, Jean, to Hexachimie. Bis-(aryloxycarboxylic acid) compounds. 4,234,742, Cl. 562-426.000.

Cohen, Milton J. Mixing and filtering vial. 4,234,083, Cl. 206-221.000.

Cohn, Marvin: *See—*
Schellenberg, James M.; and Cohn, Marvin, 4,234,854, Cl. 330-286.000.

Cohn, Robert: *See—*
Gingerich, David L.; and Cohn, Robert, 4,233,931, Cl. 118-239.000.

Coillet, Dudley W. Process for the removal of inorganic salts from a water stream. 4,234,419, Cl. 210-664.000.

Colby, Donald B., to Scott Paper Company. Adjustable and collapsible seating piece. 4,234,226, Cl. 297-21.000.

Collins, Thomas W., to Optimizer Control Corporation. Firing time control circuit. 4,234,850, Cl. 328-66.000.

Colonial Spring Company, The: *See—*
Small, Stuart R., 4,233,764, Cl. 40-152.100.

Colwell, Gary D.: *See—*
Lobach, James L.; Outteridge, David A. J.; and Colwell, Gary D., 4,234,290, Cl. 415-145.000.

Combustion Engineering, Inc.: *See—*
Maliszewski, Theodore V., 4,234,132, Cl. 241-53.000.

Comer, William T.: *See—*
Kreighbaum, William E.; and Comer, William T., 4,234,595, Cl. 424-274.000.

Cominco Ltd.: *See—*
Higgins, John T.; and Hildred, Gordon C., 4,234,318, Cl. 23-293.00S.

Commercial Affiliates, Inc.: *See—*
Ward, Robert C., 4,234,649, Cl. 428-255.000.

Compagnie de Signaux et d'Enterprises Electriques: *See—*
Le-Hong, Son, 4,234,071, Cl. 194-100.00A.

Compagnie Generale de Radiologie: *See—*
Caugant, Jean; and Dale, Jacques, 4,234,796, Cl. 250-468.000.

Compagnie Generale des Etablissements Michelin: *See—*
Pommier, Jean, 4,234,031, Cl. 152-356.00R.

Condec Corporation: *See—*
Phipps, Arthur L., 4,234,529, Cl. 264-51.000.

Condon, Richard W., to Roper Corporation. Snow bob with detachable fuel tank. 4,234,050, Cl. 180-190.000.

Conner, William R., Jr., to Kellwood Company. Web inspection apparatus. 4,234,135, Cl. 242-56.00R.

Consortium fur Elektrochemische Industrie GmbH: *See—*
Dietl, Josef; and Wohlschlager, Michael, 4,234,630, Cl. 427-431.000.

Constance, Robin Justice: *See—*
Hawkins, David J. D., 4,233,892, Cl. 99-421.00M.

Construzioni Meccaniche Lonati S.p.A.: *See—*
Lonati, Francesco, 4,233,826, Cl. 66-140.00R.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Peter, Julius; Drossler, Heinz-Gunter; and Bachmann, Willi, 4,234,029, Cl. 152-354.0RB.
Wenzel, Hubert; and Mossinger, Reinhard, 4,234,136, Cl. 242-68.400.

Contrel Corporation: *See—*
Boissicat, Claude M., 4,234,418, Cl. 209-542.000.

Controlled Environments Systems: *See—*
Widmayer, Don F., 4,234,820, Cl. 315-152.000.

Conway, Bernard W.; Fegley, Nelson L.; and Moran, James, to Dexter Corporation, The. Process for producing a uniform fiber dispersion and machine made light weight glass fiber web material. 4,234,379, Cl. 162-145.000.

Conway, Charles S. Fluid transfer system for tanker vessels. 4,233,922, Cl. 114-74.00R.

Conway, John W.: *See—*
Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., 4,234,919, Cl. 364-200.000.

Cooke, William B.: *See—*
Barabas, Miklos F.; Cooke, William B.; Hardy, R. H. Stephen; and Verma, Arun, 4,234,782, Cl. 219-365.000.

Cookson, Alan H., to Westinghouse Electric Corp. Method of forming an opening in the outer enclosure of a gas-insulated electrical apparatus. 4,234,006, Cl. 137-15.000.

Cooper, Gary F.; and Van Horn, Albert R., to Syntex (U.S.A.) Inc. Steroid synthesis process using mixed anhydride. 4,234,491, Cl. 260-340.9AS.

Cooper, William C.; and Garcia, Alberto A., to O'Brien, Linda F. Foil applicator tool. 4,233,863, Cl. 81-3.00R.

Copco, Inc.: *See—*
Jorgensen, Carsten, 4,234,094, Cl. 211-88.000.

Cork, Frank: *See—*
Ballard, Norman E.; Cork, Frank; Andrews, Philip H.; and Chappell, Francis, 4,234,653, Cl. 428-328.000.

Cornelissens, Emery G. P., to Akzo N.V. Feed unit of a detergent composition based on alkali carbonate. 4,234,442, Cl. 252-90.000.

Corning Glass Works: *See—*
Dorman, William H., 4,234,247, Cl. 350-320.000.
Kenny, Neal S., 4,233,957, Cl. 126-443.000.

Cornwall, Kenneth R. Protective flange cover and method of use. 4,233,697, Cl. 4-293.000.

Cory, Halsey W., to Force Control Industries, Inc. Centrifuge drive system. 4,234,123, Cl. 233-23.00R.

Costruzioni Meccaniche Lonati S.p.A.: *See—*
Lonati, Francesco, 4,233,822, Cl. 66-14.000.
Lonati, Francesco, 4,233,823, Cl. 66-14.000.

Cotroneo, Peter R. Illuminated door lock. 4,234,909, Cl. 362-100.000.

Coulter Electronics, Inc.: *See—*
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., 4,234,538, Cl. 422-64.000.
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., 4,234,539, Cl. 422-64.000.
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., 4,234,540, Cl. 422-64.000.

Coulter, Howard W.; and Triggs, Dennis R. Apparatus for measuring and marking preselected measurements. 4,233,749, Cl. 33-189.000.

Cour, Thomas H.: *See—*
McConnell, Thomas T.; and Cour, Thomas H., 4,234,730, Cl. 544-358.000.

Courtaulds Limited: *See—*
Stanley, Grahame L., 4,234,552, Cl. 423-268.000.

Cox of Watford Limited: *See—*
Babbs, Frederick W., 4,234,035, Cl. 160-392.000.

Credelle, Thomas L., to RCA Corporation. Flat display tube having shielding member between beam guide and screen. 4,234,815, Cl. 313-422.000.

Cricchio, Renato; and Berti, Marisa, to Gruppo Lepetit S.p.A. Process for preparing 4-desoxy-thiazolo[5,4-c]rifamycin derivatives. 4,234,485, Cl. 260-239.30P.

Crilly, William J., Jr., to Hewlett-Packard Company. Programmable frequency divider and method. 4,234,849, Cl. 328-46.000.

Crivello, James V., to General Electric Company. Photoinitiators. 4,234,732, Cl. 546-174.000.

Crompton & Knowles Corporation: *See—*
Steiner, Russell L., 4,234,481, Cl. 260-163.000.

Cronfel, Ramsey L. Fluid choke. 4,234,008, Cl. 137-182.000.

Crumrine, David F., to Neal, Gaines L., a part interest. Pollution control device for automobile carburetion. 4,233,948, Cl. 123-590.000.

CTS, Inc.: *See—*
Farrell, Richard R., 4,234,056, Cl. 184-105.00B.

Curnow, John M.: *See—*
Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., 4,233,829, Cl. 72-38.000.

Custom Packaging Systems: *See—*
LaFleur, Arthur E., 4,233,888, Cl. 493-132.000.

Cuypers, Herve; and Baekelmans, Paul, to Solvay & Cie. Process for the separation of polyolefins manufactured at low pressure. 4,234,716, Cl. 528-483.000.

Cyrulo, Jacek: *See—*
Sedlaczek, Janusz; Blazewicz, Andrzej; Cyrulo, Jacek; Krutki, Marian; and Wozniak, Tadeusz, 4,234,234, Cl. 299-43.000.

D & W International, Inc.: *See—*
Prause, Benjamin G.; and Meyers, John D., 4,234,942, Cl. 367-128.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Serving plate set or the like. 4,234,097, Cl. 220-4.00D.

DAF Indal Ltd.: *See—*
Pesando, Mario A., 4,234,143, Cl. 244-116.000.

Dagna, Giandomenico: *See—*
Guglielmi, Nicolo; Dagna, Giandomenico; and Visentin, Bruno, 4,234,871, Cl. 340-365.00S.

Dahlgren, Harold P., to Dahlgren Manufacturing Company. Reversible newspaper press. 4,233,898, Cl. 101-138.000.

Dahlgren Manufacturing Company: *See—*
Dahlgren, Harold P., 4,233,898, Cl. 101-138.000.

Dahn, C. James, to Safety Consulting Engineers Inc. Electrostatic discharge tester. 4,233,835, Cl. 73-35.000.

Daimler-Benz Aktiengesellschaft: *See—*
Gaus, Hermann; and Pickard, Jurgen, 4,233,861, Cl. 74-763.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Nishida, Fumihiko; and Ijiri, Hiroshi, 4,234,251, Cl. 355-74.000.

Dale, Jacques: *See—*
Caugant, Jean; and Dale, Jacques, 4,234,796, Cl. 250-468.000.

Dalibor, Horst, to Hoechst Aktiengesellschaft. Copolymer solution consisting of acrylic resin, process for its manufacture and the use thereof in reactive lacquers. 4,234,468, Cl. 260-31.20R.

Daly, Edward: *See—*
DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., 4,234,622, Cl. 427-45.100.

Daly, Francis P., to Hydrocarbon Research, Inc. Catalytic oxidation/-decarbonylation of polynuclear aromatic compounds. 4,234,749, Cl. 585-319.000.

Damon Corporation: *See—*
Maddestra, Robert; and Munn, David E., 4,234,148, Cl. 248-174.000.

Dana Corporation: *See—*
Cannon, Lee E., 4,234,830, Cl. 318-39.000.

Daniel, Maurice. Light emitting fabric. 4,234,907, Cl. 362-32.000.

Daniel Valve Company: *See*—
Hodgeman, Herbert H.; and Ali, Syed S., 4,234,157, Cl. 251-56.000.
Daniell, Roy B., Jr. Custom-fitted knee guard and brace. 4,233,967, Cl. 128-80.00C.
Daniels, Peter J. L.: *See*—
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,234,685, Cl. 435-80.000.
Danno, Tsuneo: *See*—
Ikushima, Hiroshi; Noguchi, Toyota; Danno, Tsuneo; and Tamura, Tooru, 4,234,859, Cl. 333-151.000.
Darlington, Raymond: *See*—
Hersom, Albert C.; Brittain, John E.; and Darlington, Raymond, 4,234,537, Cl. 422-26.000.
Darnell, Alfred J., to Rockwell International Corporation. Europium carboxide and method of preparing the same. 4,234,551, Cl. 423-263.000.
Dart Industries Inc.: *See*—
Daenen, Robert H. C. M., 4,234,097, Cl. 220-4.00D.
Dassler, Adolph, deceased: *See*—
Bente, Alfred; Dassler, Adolph, deceased; and Henkel, Albert, legal representative, 4,233,759, Cl. 36-59.00R.
Data General Corporation: *See*—
Feldstein, Michael; and Thackaberry, Harold L., 4,234,899, Cl. 360-73.000.
Dauenbaugh, Robert L., to Keystone Consolidated Industries, Inc. Changeable combination, axial pin tumbler lock with single interface. 4,233,828, Cl. 70-363.000.
Davenport, Donald E.: *See*—
Patz, Gary L.; and Davenport, Donald E., 4,234,648, Cl. 428-245.000.
Davies Hamakua Sugar Co., a division of Theo. H. Davies, Ltd.: *See*—
Suzor, Norland L. C., 4,234,349, Cl. 127-12.000.
Suzor, Norland L. C., 4,234,350, Cl. 127-48.000.
Davis, Ariel R.; and Greene, Worthington W., to Rual Industries, Inc. Circuit selector. 4,234,767, Cl. 200-1.00R.
Davis, Kirk E.: *See*—
Meinhardt, Norman A.; and Davis, Kirk E., 4,234,435, Cl. 252-51.50A.
Davis, Richard K.: *See*—
Konrad, Charles E.; and Davis, Richard K., 4,234,840, Cl. 320-48.000.
Davis, Thomas F., to AMP Incorporated. Method for immersion deposition of tin and tin-lead alloys. 4,234,631, Cl. 427-436.000.
Davis, Wilbur M.; Sawyer, Bobby G.; Nichols, John A.; and Husman, John F., to Deere & Company. Adjustable conditioning plate for an impeller mower-conditioner. 4,233,803, Cl. 56-14.900.
DBX, Inc.: *See*—
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Rogora, Edoardo; and De Angelis, Giancarlo, 4,233,943, Cl. 123-425.000.
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Trott, Clarence R.; and Willer, David A., 4,234,130, Cl. 239-679.000.
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de Filippis, Gerald; and Henry, Jean M. Laser aiming device for weapons. 4,233,770, Cl. 42-1.00A.
DeHollander, William R., to General Electric Company. Method for treating a particulate nuclear fuel material. 4,234,550, Cl. 423-261.000.
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Chihara, Takeshi; and Kono, Masanori, 4,234,153, Cl. 248-475.00B.
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den Hollander, Willem, to RCA Corporation. Combined linearity and side pincushion correction arrangement. 4,234,824, Cl. 315-371.000.
Denis, Jean-Marie D.: *See*—
Nandi, Biswa N.; Belinko, Keith; Ciavaglia, Lynn A.; Pruden, Barry B.; and Denis, Jean-Marie D., 4,234,387, Cl. 201-23.000.
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Deschner, Richard E. Apparatus for improved motion control. 4,233,885, Cl. 91-410.000.
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Fontanet, Pierre; and Desjardins, Georges, 4,234,522, Cl. 261-23.00A.
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Strobl, Frederick P., Jr.; Winchell, David A.; and DeVroom, William A., 4,234,103, Cl. 222-83.500.
Dexter Corporation, The: *See*—
Conway, Bernard W.; Fegley, Nelson L.; and Moran, James, 4,234,379, Cl. 162-145.000.
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Diamond Shamrock Corporation: *See*—
Brannan, James R., 4,234,401, Cl. 204-149.000.
Buchman, Russell, 4,234,514, Cl. 564-255.000.
Diana, Guy D.; and Carabateas, Philip M., to Sterling Drug Inc. 4-[6-(2-Chloro-4-methoxyphenoxy)hexyl]-3,5-diethyl-1-[4-(4-morpholinyl)-1-oxobutyl]-1H-pyrazole. 4,234,725, Cl. 544-140.000.
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Diem, Rudolf; and Hentrich, Hans-Jurgen, to SKF Kugellagerfabriken GmbH. Test head for inductive surface testing having plural resonant coils held in conductive holder. 4,234,848, Cl. 324-262.000.
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Dietz, Wolfgang F. W., to RCA Corporation. Synchronous switched vertical deflection driven during both trace and retrace intervals. 4,234,826, Cl. 315-393.000.
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Brackmann, Warren A.; and Dilanni, Daniel, 4,233,996, Cl. 131-140.00R.
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Dimensional Communications, Inc.: *See*—
Adelson, Alexander M.; Gulick, Stephen C.; and Grubin, Arnold L., 4,234,933, Cl. 364-900.000.
Dinardo, Carlo. Storage tanks. 4,233,789, Cl. 52-169.200.
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Janosko, Richard L.; and D'Innocente, Ralph, 4,233,694, Cl. 4-542.000.
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Duncan, Dennis A.; Beeson, Justin L.; Oberle, R. Donald; and Dirksen, Henry A., 4,234,407, Cl. 208-8.00R.
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Astle, Brian; and Dischert, Robert A., 4,234,890, Cl. 358-10.000.
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Shumway, DeWayne J.; and Gennetten, Delbert D., 4,234,863, Cl. 336-90.000.
Doan, Duc. Telephone mounting stand. 4,233,766, Cl. 40-336.000.
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Sommer, Rudiger; and Wischer, Hermann, 4,234,895, Cl. 358-282.000.

Dodge, Cleveland E., Jr. Electrostatic filter. 4,234,324, Cl. 55-156.000.

Donaghey, Lee F., to Chevron Research Company. Process for preparing photovoltaic cells having increased adhesion of the semi-conducting layer and produced thereby to the conducting layer. 4,234,353, Cl. 136-258.000.

Donahoo, Joe T., to General Electric Company. Concentrated winding salient-pole shaded pole motors having multiple short circuited shading coils for each pole and methods of making same. 4,234,810, Cl. 310-172.000.

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Meadows, David F., 4,233,790, Cl. 52-222.000.

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Wilder, Paul R.; and Oberrecht, David A., 4,234,161, Cl. 251-149.900.

Dover, Virgil L., Jr. Land restoration following oil-well drilling. 4,234,421, Cl. 210-728.000.

Dow Chemical Company, The: *See—*
del Valle, Clara J., 4,234,556, Cl. 423-497.000.
Hay, Robert A., II; and St. Louis, Harold E., 4,234,447, Cl. 252-301.10W.
Hefner, Robert E., Jr., 4,234,414, Cl. 209-166.000.
Pezzoli, Paul A., 4,234,377, Cl. 162-3.000.

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Homan, Gary R.; and Lee, Chi-Long, 4,234,697, Cl. 521-128.000.
LeGrow, Gary E., 4,234,713, Cl. 528-15.000.

Dow Corning Limited: *See—*
Westall, Stephen, 4,234,574, Cl. 424-184.000.

Dowden, Dennis L.: *See—*
Higginbotham, John W.; and Dowden, Dennis L., 4,234,253, Cl. 356-73.100.

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Boger, Manfred; and Drabek, Jozef, 4,234,573, Cl. 424-184.000.

Draheim, Frederick E. Occlusal plane orientation guide. 4,234,307, Cl. 433-73.000.

Draloric Electronic GmbH: *See—*
Schumacher, Heinz; and Zacharias, Hermann, 4,234,860, Cl. 333-187.000.

Drauz, Karlheinz: *See—*
Effenberger, Franz; and Drauz, Karlheinz, 4,234,744, Cl. 562-562.000.

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Dreher, Robert D.: *See—*
Bradley, William E.; Klatt, William M.; Kuyava, Charles C.; and Dreher, Robert D., 4,233,991, Cl. 128-733.000.

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Dreisinger, Thomas E.; and Carson, William L., to Cardrei Corporation. Wheelchair ergometer. 4,233,844, Cl. 73-379.000.

Dresser Industries, Inc.: *See—*
Lightle, John R., 4,234,293, Cl. 417-365.000.
Rea, Wayne E., 4,234,325, Cl. 55-185.000.

Dreyer, Heinz, to Amazonen-Werke H. Dreyer GmbH & Co. KG. Mounting device for agricultural spreading machines. 4,234,129, Cl. 239-661.000.

Driver, W B. Flexible drill pipe. 4,233,820, Cl. 64-2.00P.

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Peter, Julius; Drossler, Heinz-Gunter; and Bachmann, Willi, 4,234,029, Cl. 152-354.0RB.

D'Silva, Themistocles D. J., to Union Carbide Corporation. Carbamate thiosulfenylcarbamoyl fluoride compounds. 4,234,580, Cl. 424-246.000.

Dubuit, Jean-Louis. Apparatus for ultraviolet drying and/or curing of solvent-free ink on three-dimensional articles. 4,233,754, Cl. 34-203.000.

DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., to United States of America, Army. Vacuum deposition method. 4,234,622, Cl. 427-45.100.

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Duggins, Richard W.; and Rodgers, James W., to Framework, Inc. Pressure sensitive picture frame mat opening cutter. 4,233,736, Cl. 30-293.000.

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Miller, Walter E., Jr.; Duke, Jimmy R.; Starkey, George W.; and Sitton, Robert L., 4,234,141, Cl. 244-3.130.

Duncan, Dennis A.; Beeson, Justin L.; Oberle, R. Donald; and Dirksen, Henry A., to United States of America, Energy. Reactor and method for hydrocracking carbonaceous material. 4,234,407, Cl. 208-8.00R.

Duncan, Dennis A., to United States of America, Energy. Process for hydrocracking carbonaceous material in liquid carrier. 4,234,408, Cl. 208-8.00R.

Dunshee, Wayne K., to Minnesota Mining and Manufacturing Company. Styptic device. 4,233,976, Cl. 128-260.000.

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Lawrence, Frederick R., 4,234,470, Cl. 568-939.000.
Mrowca, Joseph J., 4,234,729, Cl. 544-243.000.
Peiffer, Robert W., 4,234,626, Cl. 427-97.000.
Woods, Thomas S., 4,234,592, Cl. 424-270.000.

Durfee, Frederick G.: *See—*
Carter, Harold V.; and Durfee, Frederick G., 4,234,257, Cl. 356-417.000.

DuRose, Arthur H., to Harshaw Chemical Company, The. Two-step preplate system for polymeric surfaces. 4,234,628, Cl. 427-305.000.

Dyachkovsky, Fridrikh S.: *See—*
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.

Dyna Plastik-Werke GmbH: *See—*
Stark, Gerd, 4,234,032, Cl. 160-261.000.

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El-Chahawi, Moustafa; and Prange, Uwe, 4,234,545, Cl. 423-138.000.
Kappler, Fritz-Robert; and Seiler, Claus-Dietrich, 4,234,502, Cl. 556-413.000.
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Hoehn, Hans, 4,234,589, Cl. 424-256.000.
Krapcho, John; and Schwartz, Joseph, 4,234,602, Cl. 424-330.000.
Ondetti, Miguel A.; Gordon, Eric M.; and Ryono, Denis E., 4,234,489, Cl. 260-326.420.

E-Systems, Inc.: *See—*
Mosley, William H.; and Andren, Carl F., 4,234,966, Cl. 455-326.000.
Wilson, Lee E., 4,234,215, Cl. 285-41.000.

Eapen, Kuttikandathil E.: *See—*
Kahn, Marvin L.; and Eapen, Kuttikandathil E., 4,234,611, Cl. 426-321.000.

Earing, Mason H.; Gielinski, Leonard H.; Martin, Paul F.; and Petschke, Glenn H., to Textron Inc. Preparation of single-phase, urethane prepolymers from hydroxy-terminated diene polymers. 4,234,714, Cl. 528-67.000.

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Ford, John A.; and Lestina, Gregory J., 4,234,672, Cl. 430-222.000.
Kaukeinen, Joseph Y.; and Rockafellow, Duane A., 4,234,670, Cl. 430-52.000.

Edelman, Robert; Berardinelli, Frank M.; and Wissbrun, Kurt F., to Celanese Corporation. Extrusion grade polyethylene iso/terephthalate copolymer. 4,234,708, Cl. 525-444.000.

Edna McConnell Clark Foundation: *See—*
Bueding, Ernest; Werbel, Leslie M.; and Worth, Donald F., 4,234,583, Cl. 424-250.000.

Edo Corporation: *See—*
Miko, Richard J., 4,233,883, Cl. 89-1.50B.

Edwards, Derek R.; and Gosling, Cyril H., to BICC Limited. Oil-filled electric cable installations comprising pressurizing oil tanks. 4,234,754, Cl. 174-14.00R.

Edwardson, Svante R., to AB Dentatus. Hand tool. 4,233,850, Cl. 74-44.000.

Effenberger, Franz; and Drauz, Karlheinz, to Deutsche Gold- und Silber Scheideanstalt vormals Roessler. Process for the production of aminoacid hydrochlorides/or diaminoacid dihydrochlorides. 4,234,744, Cl. 562-562.000.

Eggleton, Reginald C.; and Williamson, Warren L., to Indianapolis Center For Advanced Research. Peak detector for resolution enhancement of ultrasonic visualization systems. 4,234,937, Cl. 367-11.000.

Eichweber, Kurt, to Precitronic Gesellschaft fur Feinmechanik und Electronic mbH. Azimuthably layable or aimable launching device, more particularly for canisters containing camouflaging means or agents. 4,233,882, Cl. 89-1.00L.

Eidling, Karl: *See—*
Dreisbach, Bodo; and Eidling, Karl, 4,234,254, Cl. 356-244.000.

Eiseman, Fred S.: *See—*
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El-Chahawi, Moustafa; and Prange, Uwe, to Dynamit Nobel Aktiengesellschaft. Process for the recovery of cobalt values. 4,234,545, Cl. 423-138.000.

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Swanson, Richard M., 4,234,352, Cl. 136-253.000.
Thompson, John H.; Gannon, George F., Jr.; and Geil, Fred G., 4,233,843, Cl. 73-339.00A.

Electro-Pneumatic International GmbH: *See—*
Harshman, Ray E.; and Landry, Archie C., 4,234,278, Cl. 410-69.000.

Electrode Dressers Incorporated: *See—*
Meier, George D., Jr., 4,234,276, Cl. 408-104.000.

Eli Lilly and Company: *See—*
Abbott, Bernard J.; and Whitney, John G., 4,234,684, Cl. 435-75.000.

Elliott Brothers (London) Limited: *See—*
Beasley, Robin D.; Hall, Trevor I.; and Morgon, Trevor A., 4,234,970, Cl. 455-607.000.

Elliott, Raymond D.: *See—*
Dick, Donald E.; Metz, Robert L.; RoJohn, D. Scott; and Elliott, Raymond D., 4,233,988, Cl. 128-660.000.

Ema, Ichiro. Method of removing offensive odor from the meat of sharks. 4,234,610, Cl. 426-248.000.

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Krieger, David, 4,233,916, Cl. 112-90.000.

Emhart Industries, Inc.: *See—*
Small, James E., 4,234,801, Cl. 307-38.000.

Emmons, William D.; and Moser, Vincent J., to Rohm and Haas Company. Anaerobic adhesive and/or sealing compositions comprising dicyclopentenyloxyethyl (meth)acrylates. 4,234,711, Cl. 526-282.000.

Empire Plastics Manufacturing Inc.: *See—*
Yardley, Lloyd M., 4,233,990, Cl. 128-728.000.

Encomech Engineering Services Ltd.: *See—*
Laws, William R.; and Reed, Geoffrey R., 4,233,959, Cl. 126-426.000.

Endo, Takaya: *See—*
Yoshimoto, Shinji; Fujiwhara, Mitsuto; Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Nakagawa, Satoshi, 4,234,678, Cl. 430-564.000.

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Tarpley, William B., Jr., 4,234,432, Cl. 252-8.000.

Engelen, Willy L. J., to U.S. Philips Corporation. Electric mixed light lamp. 4,234,818, Cl. 315-49.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Aliotta, Joseph; and Alcuri, Louis F., 4,234,339, Cl. 75-255.000.
Hoeschele, James D.; and Amundsen, Alan R., 4,234,499, Cl. 260-429.00R.
Hoeschele, James D.; and Amundsen, Alan R., 4,234,500, Cl. 260-429.00R.

Engineered Systems, Inc.: *See—*
Van Ness, Bradford O.; and Weimer, Dan G., 4,234,920, Cl. 364-200.000.

Enikolopov, Nikolai S.: *See—*
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.

Enke, Christie G.; Yost, Richard A.; and Morrison, James D., to Research Corporation. Tandem quadrupole mass spectrometer for selected ion fragmentation studies and low energy collision induced dissociator therefor. 4,234,791, Cl. 250-281.000.

Enneking, Heinrich, to Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft. Device for winding textile threads. 4,234,133, Cl. 242-45.000.

Envel Corporation: *See—*
Mayer, Ben, 4,233,794, Cl. 52-484.000.

Erich, Otis G., Jr., to Union Oil Company of California. Seismic exploration method using a rotating eccentric weight seismic source. 4,234,053, Cl. 181-121.000.

Erlandson, Roger S. Archery arrow head. 4,234,191, Cl. 273-421.000.

Eshghy, Siavash, to Rockwell International Corporation. Tension control of fasteners. 4,233,721, Cl. 29-407.000.

Eshghy, Siavash, to Rockwell International Corporation. Tension control of fasteners. 4,233,722, Cl. 29-407.000.

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Eshraghian, Kamran; and Bogner, Robert E., to U.S. Philips Corporation. Vehicle detection systems. 4,234,923, Cl. 364-436.000.

Esser, Leonard J. M.; and Heldens, Ludovicus G. M., to U.S. Philips Corporation. Ladder device with weighting factor adjusting means. 4,234,807, Cl. 307-304.000.

Etat Francais: *See—*
Melchior, Jean F., 4,233,815, Cl. 60-606.000.

Eue, Ludwig: *See—*
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,234,722, Cl. 544-58.400.

Evans, James A.: *See—*
Hein, Paul R.; Evans, James A.; and Yang, Michael W., 4,234,676, Cl. 430-286.000.

EVC, Inc.: *See—*
Carlsen, George D., II, 4,234,805, Cl. 307-254.000.

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Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,233,870, Cl. 83-563.000.

Fahlesson, Kjell T., to LGZ Landis & Gyr Zug AG. Process and device for the protection of electrical energy supply systems controlled by means of audio-frequency. 4,234,904, Cl. 361-165.000.

Fairbanks, Everitt E., to CAS Products, Inc. Method and apparatus for the therapeutic treatment of living tissue. 4,233,965, Cl. 128-1.500.

Faith, Donald L. Optical firing adaptor. 4,234,911, Cl. 362-111.000.

Falbesaner, Egon; Bichler, Josef; and Wimmer, Eberhard, to Wacker-Chemie GmbH. Process for removal of mercury and mercury compounds from aqueous solutions and industrial waste liquors. 4,234,422, Cl. 210-713.000.

Fansteel, Inc.: *See—*
Ghandehari, Mohammad H.; and Schussler, Mortimer, 4,234,333, Cl. 75-0.5BA.

Fantini, Amedeo A.: *See—*
Tresner, Homer D.; Fantini, Amedeo A.; Borders, Donald B.; and McGahren, William J., 4,234,717, Cl. 536-17.00R.

Farrell, Richard R., to CTS, Inc. Lubrication fitting. 4,234,056, Cl. 184-105.00B.

Fassle, Fritz, to Guilini Chemie GmbH. Method for producing hard plaster of paris. 4,234,345, Cl. 106-110.000.

Faulkner, Douglas E., to Burroughs Wellcome Co. Device and method for quantitative uric acid testing. 4,234,313, Cl. 23-230.00B.

Faust, John A. Collapsible chair. 4,234,227, Cl. 297-443.000.

Favie, Claude, to Societe Nationale Elf Aquitaine (Production). Preparation of sulphonium polymers. 4,234,692, Cl. 521-33.000.

FEBS International, Ltd.: *See—*
Shima, Eiji; Shimizu, Masao; and Den, Hiroshi, 4,234,146, Cl. 248-63.000.

Fegley, Nelson L.: *See—*
Conway, Bernard W.; Fegley, Nelson L.; and Moran, James, 4,234,379, Cl. 162-145.000.

Feingold, Alfred. Curvilinear electrocardiograph electrode strip. 4,233,987, Cl. 128-639.000.

Feldstein, Michael; and Thackaberry, Harold L., to Data General Corporation. Keyed mounting for orienting optical angular, displacement transducer in rigid magnetic disc memory. 4,234,899, Cl. 360-73.000.

Fenoli, John: *See—*
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Ferdinand, Irwin J., to Hirsh Company. Shelf standard. 4,233,912, Cl. 108-109.000.

Ferdon, Gilbert D.: *See—*
Bowen, Terry P.; Hoover, Charles D.; Ferdon, Gilbert D.; and Harwood, Robert G., 4,233,724, Cl. 29-428.000.

Fiedler, Franz, to Bayer Aktiengesellschaft. α-N-Acetyl-L-phenylalanyl-L-arginine ethyl ester. 4,234,477, Cl. 260-112.50R.

Field, Ronald E.: *See—*
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Fieldcrest Mills, Inc.: *See—*
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Fieux, Robert E. Means and method of restoring documents, paintings and the like. 4,234,621, Cl. 427-13.000.

Figueroa, Ruben. File support structure for drawer. 4,234,238, Cl. 312-184.000.

Filipowicz, Carl: *See—*
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Filtrol Corporation: *See—*
Alafandi, Hamid; and Stamires, Dennis, 4,234,457, Cl. 252-438.000.

Finch, Harry E.; and Szayer, Geza J. Exterior safety lock apparatus. 4,234,220, Cl. 292-148.000.

Finike Italiana Marposs S.p.A.: *See—*
Possati, Mario, 4,233,744, Cl. 33-143.00L.

Finkelstein, Ronald S.: *See—*
McKenna, Lawrence W., Jr.; Finkelstein, Ronald S.; and Haynes, John K., Jr., 4,234,660, Cl. 428-411.000.

Firm Wilh. Quester: *See—*
Quester, Karl W.; Gontgen, Josef; and Muller, Adolf, 4,233,997, Cl. 131-147.00R.

Firmaframe Nominees Proprietary Limited: *See—*
Leivenzon, Simon; and Leivenzon, Steven, 4,234,033, Cl. 160-133.000.

Firmenich, S.A.: *See—*
Petrzilka, Martin, 4,234,741, Cl. 560-211.000.

First, Theodore C. Micro processor controlled sensor system for apartment house. 4,234,927, Cl. 364-557.000.

Fischer, Thomas R.; and Stelzer, Robert A., to Paul Revere Corporation. Corn head snapping rolls. 4,233,804, Cl. 56-104.000.

Fischman, Martin, to GTE Products Corporation. Cathode ray tube with internal arc suppressor and protective spark gap. 4,234,816, Cl. 313-479.000.

Fisher, Richard A., to Globe Iron Construction Co., Inc. Three dimensional layout tool. 4,233,747, Cl. 33-174.00R.

Flamm, Jonathan A. Modular articulating seating system for the handicapped. 4,234,228, Cl. 297-464.000.

Flanagan, Joseph E., to Rockwell International Corporation. Solid propellant hydrogen generator. 4,234,363, Cl. 149-19.400.

Flanner, Lloyd T. Wasp and hornet spray composition. 4,234,567, Cl. 424-45.000.

Fleisch, Herbert C.: *See—*
Gunther, Harald; and Fleisch, Herbert C., 4,234,645, Cl. 424-204.000.

Flick, Francis S., to Health & Education Services Corporation. Skinfold caliper. 4,233,743, Cl. 33-143.00C.

Flink, Birger. Method and arrangement for heat-welding together two tubular elements. 4,234,781, Cl. 219-243.000.

Flodin, Per G. M.; Komlos, Peter G.; and Ranby, Bengt G., to Astra Chemical Products AB. Polymer. 4,234,565, Cl. 424-33.000.

Florean, Jean: *See—*
Taupin, Pierre; Glineur, Michel; and Florean, Jean, 4,234,330, Cl. 65-21.000.

FMC Corporation: *See—*
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Swanson, Harold N.; and Pashalis, Cryssis, 4,234,216, Cl. 285-93.000.

Fodor, Lawrence M.: *See—*
Moberly, Charles W.; Welch, Melvin B.; and Fodor, Lawrence M., 4,234,710, Cl. 526-125.000.

Fontanet, Pierre; and Desjardins, Georges, to Regie Nationale des Usines Renault. Variable diffuser for carburetors. 4,234,522, Cl. 261-23.00A.

Force Control Industries, Inc.: *See—*
Cory, Halsey W., 4,234,123, Cl. 233-23.00R.

Ford Aerospace & Communications Corp.: *See*—
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Ford, Daniel E.; and Pyle, Jeffrey A., to Westinghouse Electric Corp. Hole alignment probe. 4,233,748, Cl. 33-180.00R.

Ford, John A.; and Lestina, Gregory J., to Eastman Kodak Company. Shifted photographic dyes and compositions, elements and processes employing them. 4,234,672, Cl. 430-222.000.

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Gray, Dorian R.; Bishop, Richard N.; and Timmons, William K., 4,233,933, Cl. 118-314.000.
Gray, Dorian R.; Guerra, Salvatore; and Meyer, John H., 4,234,331, Cl. 65-60.00R.
McNally, Thomas E.; Holka, Thomas C.; and Moreau, Harold T., 4,234,210, Cl. 280-804.000.
Rhodes, Eugene E., 4,233,719, Cl. 29-157.30A.

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Forest Mechanical Products Corp.: *See*—
Kuenzig, Ernest O.; and Pennino, Frank L., 4,234,299, Cl. 425-292.000.

Forrest, Stanley G.; and Spashett, Michael C., to Guy Colins Co. Limited. Board game. 4,234,186, Cl. 273-243.000.

Foulke, Richard F. Vibration-free tailless wire bonder. 4,234,117, Cl. 228-4.500.

Fournet, Maurice, to Organisation Europeenne de Recherches Spatiales. Observation optical apparatus. 4,234,789, Cl. 250-234.000.

Framework, Inc.: *See*—
Duggins, Richard W.; and Rodgers, James W., 4,233,736, Cl. 30-293.000.

Frampton, Orville D.; and Birchall, William R., to National Distillers and Chemical Corp. Process for the hydration of olefins employing slurried catalyst. 4,234,748, Cl. 568-901.000.

Francis, Marion D.: *See*—
Tofe, Andrew J.; and Francis, Marion D., 4,234,562, Cl. 424-1.000.

Frank, Ed, to Boeing Company, The. Bi-directional step-over tape applicator head. 4,234,374, Cl. 156-459.000.

Franks, John A., Jr., to Vulcan Materials Company. Electrolytic process for the production of stannous chloride products. 4,234,403, Cl. 204-180.00P.

Franzischka, Wolfgang: *See*—
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Friberg, Stig E.; and Roberts, Kelvin, to Arbman Development AB. Suspension of solid particles in a liquid. 4,234,437, Cl. 252-62.510.

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Winter, Werner; Friebe, Walter-Gunar; Kampe, Wolfgang; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,234,585, Cl. 424-250.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
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Bjorklund, Lowell L.; Berg, Ramon A.; and Friedland, George A., 4,233,880, Cl. 85-41.000.

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Frischmann, Peter G.; Luborsky, Fred E.; and Tompkins, Russell E., to General Electric Company. Method of making hysteresis motor rotor using amorphous magnetic alloy ribbons. 4,234,360, Cl. 148-121.000.

Fritz, Rolf; and Kissel, Karl-Friedrich, to Hochtemperatur-Reaktorbau GmbH. Support structure for the core of a high capacity gas cooled high temperature reactor. 4,234,384, Cl. 176-58.0PB.

Frohberger, Paul-Ernst: *See*—
Maurer, Fritz; Schroder, Rolf; Hammann, Ingeborg; Homeyer, Bernhard; and Frohberger, Paul-Ernst, 4,234,587, Cl. 424-251.000.

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Tada, Sugihiko; Yanagihara, Kazuhiko; and Arakawa, Jun, 4,234,392, Cl. 203-91.000.
Yamagisi, Kikuo; Okuyama, Hiroshi; and Kawaguchi, Hideo, 4,234,300, Cl. 425-363.000.

Fujikura Cable Works, The: *See*—
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Fujimori, Sadao, to Tokyo Shobundo & Co., Ltd. Engraving board for print-production. 4,234,646, Cl. 428-215.000.

Fujisawa, Hideya: *See*—
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Fujisawa Pharmaceutical Company, Limited: *See*—
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Fujita, Saburo: *See*—
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Fujiwara, Yukio; Yamaji, Shigeru; Shibuya, Yoshikazu; and Nitta, Tohei, to Mitsubishi Denki Kabushiki Kaisha. Enclosed lightning arrester. 4,234,902, Cl. 361-120.000.

Fujiwhara, Mitsuto: *See*—
Yoshimoto, Shinji; Fujiwhara, Mitsuto; Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Nakagawa, Satoshi, 4,234,678, Cl. 430-564.000.

Fukinbara, Itaru: *See*—
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Gable, Melvin G.; and Sherman, Richard H., to Ford Motor Company. Conflict resolution by retransmission delay on shared communication medium. 4,234,952, Cl. 370-94.000.

GAF Corporation: *See*—
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Morshauser, Fred S., 4,234,464, Cl. 252-544.000.

Gallanis, George P.; Spohr, Albert R.; and Lube, Robert R., to Sunbeam Corporation. Electric shaver. 4,233,733, Cl. 30-43.920.

Gallant, Guy G. Water ski rack. 4,234,112, Cl. 224-42.430.

Gange, Robert A., to RCA Corporation. System for controlling brightness uniformity in display devices. 4,234,825, Cl. 315-383.000.

Gannon, George F., Jr.: *See*—
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Ganslaw, Stuart H.: *See*—
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Garcia, Alberto A.: *See*—
Cooper, William C.; and Garcia, Alberto A., 4,233,863, Cl. 81-3.00R.

Gardner, Derek V., to Beecham Group Limited. Heterocyclic containing chromans. 4,234,726, Cl. 544-151.000.

Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,234,601, Cl. 424-319.000.

Garrett Corporation, The: *See*—
Rowlett, Beb H., 4,233,858, Cl. 74-675.000.

Garrison, Robert L.; and Morris, James C., to GTE Products Corporation. Control circuit providing constant power source. 4,234,822, Cl. 315-209.00R.

Garskamp, Arnoldus, to U.S. Philips Corporation. Receiver comprising a tuning member and an automatic tuning correction suppression circuit. 4,234,961, Cl. 455-160.000.

Gauld Equipment Manufacturing Co.: *See*—
Gauld, W. Thomas; and Thomsen, Eigild S., 4,234,417, Cl. 209-306.000.

Gauld, W. Thomas; and Thomsen, Eigild S., to Gauld Equipment Manufacturing Co. Fibrous stock screen. 4,234,417, Cl. 209-306.000.

Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, to Braun Aktiengesellschaft. Phonograph turntable control system. 4,234,836, Cl. 318-480.000.

Gaus, Hermann; and Pickard, Jurgen, to Daimler-Benz Aktiengesellschaft. Change-speed transmission. 4,233,861, Cl. 74-763.000.

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Gawrilow, Ilija, to SCM Corporation. Fluid shortening. 4,234,606, Cl. 426-24.000.

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Gehring, Rudolf; and Brandenberger, Albert, to Maschinenfabrik Benninger AG. Thread guide at a warp creel. 4,234,138, Cl. 242-131.100.

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Gellert, Jobst U. Collapsible container. 4,234,080, Cl. 206-0.820.

General Dynamics Corporation, Pomona Division: *See*—
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General Electric Company: *See*—
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Anthony, Thomas R.; Cline, Harvey E.; Hartman, David K.; and Chang, Mike F., 4,233,934, Cl. 118-500.000.
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Arendt, Ronald H.; and Rosolowski, Joseph H., 4,234,558, Cl. 423-593.000.

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Koenig, Fredrick, 4,233,729, Cl. 29-596.000.
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Murray, Omer E.; and Thompson, Richard L., 4,234,165, Cl. 248-404.000.
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Schindler, Donald R., 4,234,906, Cl. 362-16.000.
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Stottmann, Richard L., 4,233,819, Cl. 62-349.000.
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General Electric Company Limited, The: *See—*
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General Signal Corporation: *See—*
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Gennetten, Delbert D.: *See—*
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George Koch Sons, Inc.: *See—*
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Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, to Gerhard Berger GmbH & Co. Fabrik Elektrischer Messgerate. Stepping motor. 4,234,808, Cl. 310-49.00R.

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Gernlein, Hermann, to Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft. Tube filling machine having an adjustable stroke, cam operated piston. 4,234,107, Cl. 222-309.000.

Ghandehari, Mohammad H.; and Schussler, Mortimer, to Fansteel, Inc. Process for recovering metal carbide powder from cemented carbides. 4,234,333, Cl. 75-0.5BA.

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Gibbs, Richard E.: *See—*
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Gibu, Yoshitaka: *See—*
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Gieske, Edward T., Jr. Tobacco tying product. 4,233,808, Cl. 57-200.000.

Gillette Company, The: *See—*
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Gingerich, David L.; and Cohn, Robert, to Champion International Corporation. Envelope feed apparatus. 4,233,931, Cl. 118-239.000.

Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., to Coulter Electronics, Inc. Apparatus for monitoring chemical reactions and employing moving photometer means. 4,234,538, Cl. 422-64.000.

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Girling Limited: *See—*
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Gjerde, Trygve; Vigander, Kjell; Jenssen, Dag N.; and Hjertas, Bjorn, to A/S Hoyer-Ellefsen. Marine structure. 4,234,270, Cl. 405-202.000.

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Glitsch, Inc.: *See—*
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Global Marine, Inc.: *See—*
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Globe Iron Construction Co., Inc.: *See—*
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Godbe, James R. Boiler tube pulling method and apparatus. 4,233,730, Cl. 29-727.000.

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Goff, Otis W.; and Goff, Melvin J. Quick release clamp. 4,234,176, Cl. 269-156.000.

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Gomi, Hiroshi, to Tokyo Shibaura Electric Co., Ltd. Voltage controlled oscillator with phase control circuits. 4,234,858, Cl. 331-177.00R.

Gontgen, Josef: *See—*
Quester, Karl W.; Gontgen, Josef; and Muller, Adolf, 4,233,997, Cl. 131-147.00R.

Goodhart, Robert D. Material-dispensing implement. 4,234,109, Cl. 222-609.000.

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Goossens, John C.: *See—*
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Goralnik, Charles D. Lighting fixture. 4,234,916, Cl. 362-294.000.

Gordon, Eric M.: *See—*
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Gorgens, Richard A., to Honeywell Information Systems Inc. Security system for remote cash dispensers. 4,234,932, Cl. 364-900.000.

Gosling, Cyril H.: *See—*
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Goss, Michael J.; and Redford, David A., to Texaco Canada Inc. Method for evaluation of the response of different cores to a recovery process and apparatus therefor. 4,233,840, Cl. 73-153.000.

Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, to EVG Entwickoungs-Gesellschaft mbH. Shearing machine for severing parallel longitudinal members of grids or gratings. 4,233,870, Cl. 83-563.000.

Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserrukkuhlanlagen GmbH & Co. Kommanditgesellschaft: *See—*
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Gottzein, Eveline; Roche, Christian; and Bohn, Gerhard, to Messerschmitt-Bolkow-Blohm GmbH. Magnetically suspended vehicle. 4,233,905, Cl. 104-281.000.

Gould Inc.: *See—*
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Governor & Company of the Bank of England: *See—*
Lee, Peter D., 4,234,214, Cl. 283-57.000.

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Schulz, Johann G.; Onopchenko, Anatoli; and Sabourin, Edward T., 4,234,743, Cl. 562-457.000.

Graham, Joseph, to Minnesota Mining and Manufacturing Company. Intumescable fire-retardant products. 4,234,639, Cl. 428-144.000.

Graham, Roy R., to PPG Industries, Inc. Size composition for glass fibers. 4,233,809, Cl. 57-250.000.

Graham, William H.; and Shepard, Inella G., to Thiokol Corporation. Hydroxy terminated polybutadiene based polyurethane bound propellant grains. 4,234,738, Cl. 560-32.000.

Grall, Georges, to Thomson-CSF. Array system with a high resolving power. 4,234,939, Cl. 367-87.000.

Grasselli, Robert K.: *See—*
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Gray, Dorian R.; Bishop, Richard N.; and Timmons, William K., to Ford Motor Company. Spray coating machine. 4,233,933, Cl. 118-314.000.

Gray, Dorian R.; Guerra, Salvatore; and Meyer, John H., to Ford Motor Company. Coating method. 4,234,331, Cl. 65-60.00R.

Gray, James, Jr., to United States of America, Energy. Multiplexer and time duration measuring circuit. 4,234,949, Cl. 370-41.000.

Greenbat Limited: *See—*
Clokie, Andrew K., 4,234,021, Cl. 139-371.000.

Greene, Worthington W.: *See—*
Davis, Ariel R.; and Greene, Worthington W., 4,234,767, Cl. 200-1.00R.

Grefe, William O.: *See—*
Kenly, William L., V; Grefe, William O.; and Lawrence, Walter H., 4,234,800, Cl. 250-540.000.

Greuel, Walter J., Jr., to Raychem Corporation. Heat recoverable closure assembly and method. 4,234,020, Cl. 138-166.000.

Greuter, Hans; Martin, Pierre; and Bellus, Daniel, to Ciba-Geigy Corporation. 2-(2',2'-Dihalovinyl)-cyclobutanones and 2-(2',2',2'-trihaloethyl)-cyclobutanones. 4,234,517, Cl. 568-381.000.

Greve, Clifford W.: *See—*
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Griffith, Jerry. Automatic environment stabilizer and protection device for plants. 4,233,779, Cl. 47-26.000.

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Gronau, Manfred; Mascher, Werner; and Pampuch, Klaus, to Auergesellschaft GmbH. Respirator. 4,233,971, Cl. 128-202.260.

Grosshauser, Anton: *See—*
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Grotefend, Alan C.; and Thon, Stephen F., to Meyercord Co., The. Tennis ball marking decalcomania. 4,234,643, Cl. 428-200.000.

Grubb, John W.: *See—*
Bankes, Robert B.; and Grubb, John W., 4,234,118, Cl. 228-49.00R.

Grubin, Arnold L.: *See—*
Adelson, Alexander M.; Gulick, Stephen C.; and Grubin, Arnold L., 4,234,933, Cl. 364-900.000.

Gruppo Lepetit S.p.A.: *See—*
Cricchio, Renato; and Berti, Marisa, 4,234,485, Cl. 260-239.30P.

GTE Automatic Electric Laboratories Incorporated: *See—*
Kline, Ralph L., 4,234,953, Cl. 371-5.000.
Tracey, Robert J.; Bradley, Stevan D.; and Hartley, William F., 4,234,957, Cl. 375-86.000.

GTE Products Corporation: *See—*
Fischman, Martin, 4,234,816, Cl. 313-479.000.
Garrison, Robert L.; and Morris, James C., 4,234,822, Cl. 315-209.00R.
Hoeft, Jon L., 4,234,962, Cl. 455-173.000.

GTE Sylvania Incorporated: *See—*
Kaelin, Oscar J.; and Mathews, Richard H., 4,234,883, Cl. 343-100.0CL.

Guckel, Henry; and Larsen, Steven T., to Wisconsin Alumni Research Foundation. Process for producing an electrostatically deformable thin silicon membranes utilizing a two-stage diffusion step to form an etchant resistant layer. 4,234,361, Cl. 148-186.000.

Guerin, Bernard: *See—*
Deleens, Gerard; Guerin, Bernard; and Kern, Rene, 4,234,184, Cl. 273-235.00R.

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Guglielmi, Nicolo; Dagna, Giandomenico; and Visentin, Bruno, to Ing. C. Olivetti & C., S.p.A. Capacitive keyboard for data processing equipments. 4,234,871, Cl. 340-365.00S.

Guilini Chemie GmbH: *See—*
Fassle, Fritz, 4,234,345, Cl. 106-110.000.

Gulick, Stephen C.: *See—*
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Gunther, Harald; and Fleisch, Herbert C., to Procter & Gamble Company, The. Pharmaceutical composition. 4,234,645, Cl. 424-204.000.

Gursky, Michael T., to Western Electric Company, Inc. Carrier tapes for semiconductor devices. 4,234,666, Cl. 428-573.000.

Gutierrez, Abel, Jr. Upper main bearing removal tool. 4,233,864, Cl. 81-3.00R.

Gutman, Arnold D.: *See—*
DeBaun, Jack R.; Pallos, Ferenc M.; and Gutman, Arnold D., 4,234,593, Cl. 424-272.000.

Gutnick, David L.; Rosenberg, Eugene; and Shabtai, Yossef, to Biotechnologie Aktiengesellschaft fur Emulsan. Production of α-emulsans. 4,234,689, Cl. 435-101.000.

Guy Colins Co. Limited: *See—*
Forrest, Stanley G.; and Spashett, Michael C., 4,234,186, Cl. 273-243.000.

Guzy, Raymond L., to Borg-Warner Corporation. Cable splice. 4,234,758, Cl. 174-84.00R.

Gwynn, Eric C.: *See—*
Boniface, John A.; Field, Ronald E.; Gwynn, Eric C.; and Turner, William L. A., 4,233,755, Cl. 35-11.00R.

Gyugyi, Laszlo; and Wood, Peter, to Westinghouse Electric Corp. Static VAR generator with discrete capacitive current levels. 4,234,843, Cl. 323-119.000.

Gyugyi, Laszlo: *See—*
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H. K. Webster Company, Inc.: *See—*
Webster, Ralph K., 4,233,941, Cl. 119-52.00R.

Haga, Tamio: *See—*
Nishimura, Yasushi; Uehara, Yasuo; and Haga, Tamio, 4,234,460, Cl. 252-447.000.

Hagen, Edward L., to Uniroyal, Inc. Polyurethane spray composition containing lactone viscosity modifier. 4,234,445, Cl. 252-182.000.

Hager, Adolph G.: *See—*
DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., 4,234,622, Cl. 427-45.100.

Hagiwara, Daijiro: *See—*
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Hahn, Paul R. T.: *See—*
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Halcon Research and Development Corp.: *See—*
Brown, David, 4,234,718, Cl. 536-69.000.
Wan, Chee-Gen, 4,234,719, Cl. 536-69.000.
Yeoman, Neil; and Stern, Sidney S., 4,234,519, Cl. 568-492.000.

Halder, Mathis, to LGZ Landis & Gyr Zug AG. Circuit arrangement for a keyboard. 4,234,872, Cl. 340-365.00R.

Hall, John B.: *See—*
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Hall, Trevor I.: *See—*
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Hallgren, John E.; and Smith, William E., to General Electric Company. Carbonylation process. 4,234,504, Cl. 260-463.000.

Halliburton Company: *See—*
Tinsley, John M.; and Watters, Larry T., 4,234,344, Cl. 106-88.000.

Hamada, James H.; Bender, Jeffrey R.; Price, Earl T.; and Ingebretsen, Dennis A., to HBTI. Method and apparatus for sensing jaw position and movements and utilizing sensed data. 4,234,306, Cl. 433-55.000.

Hamar, Douglas A. Animated illustration for books and the like. 4,233,772, Cl. 46-35.000.

Hamer, David E.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Hamer, David E.; and Paaren, Herbert E., 4,234,495, Cl. 260-397.200.

Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., to Rockwell International Corporation. Apparatus for superplastic forming. 4,233,829, Cl. 72-38.000.

Hamilton, C. Howard; and Weisert, Edward D., to Rockwell International Corporation. Method for superplastic forming. 4,233,831, Cl. 72-60.000.

Hamilton, Miles J., to DEC International, Inc. Vehicle body. 4,234,286, Cl. 414-512.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 4,233,896, Cl. 101-110.000.

Hammann, Ingeborg: *See—*
Maurer, Fritz; Schroder, Rolf; Hammann, Ingeborg; Homeyer, Bernhard; and Frohberger, Paul-Ernst, 4,234,587, Cl. 424-251.000.
Sirrenberg, Wilhelm; Hammann, Ingeborg; Stendel, Wilhelm; and Klauke, Erich, 4,234,600, Cl. 424-310.000.

Handleman, Avrom R.; and Alack, Charles S. Fluidizable material handling apparatus. 4,234,273, Cl. 406-90.000.

Hane, Teruaki: *See—*
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Hans Giesbert Kommanditgesellschaft: *See—*
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Hansen, Soren R.: *See—*
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Hara, Hiroshi: *See—*
Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, 4,234,305, Cl. 432-59.000.

Hara, Keiichi; and Fujisawa, Tomoji, to Nippon Kokan Kabushiki Kaisha. Inner burr cutting, inner face cleaning and inner face painting apparatus for long pipes of small and medium diameters. 4,233,928, Cl. 118-35.000.

Harasaki, Hayatsugu; and Teramoto, Isao, to Toyo Kogyo Co., Ltd. Rear reinforcement structure for automobile bodies. 4,234,225, Cl. 296-185.000.

Hard, Chester A., III: *See—*
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Hardy, R. H. Stephen: *See—*
Barabas, Miklos F.; Cooke, William B.; Hardy, R. H. Stephen; and Verma, Arun, 4,234,782, Cl. 219-365.000.

Harlow, Norman R., to Carlisle Corporation. Miniature coaxial cable assembly. 4,234,759, Cl. 174-104.000.

Harmon, Thomas F.: *See—*
Malinowski, Richard F.; and Harmon, Thomas F., 4,234,915, Cl. 362-252.000.

Harnisch, Horst; and Brack, Alfred, to Bayer Aktiengesellschaft. Benz-[c,d]-indolyl compounds. 4,234,488, Cl. 260-326.270.
Harper, John: *See*—
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Harper, Patrick D., to Bendix Corporation, The. Inductive load driver circuit effecting slow hold current delay and fast turn off current decay. 4,234,903, Cl. 361-154.000.
Harris Corporation: *See*—
Riley, William J., Jr., 4,234,929, Cl. 364-701.000.
Harshaw Chemical Company, The: *See*—
DuRose, Arthur H., 4,234,628, Cl. 427-305.000.
Harshman, Ray E.; and Landry, Archie C., to Electro-Pneumatic International GmbH. Locking devices for cargo and the like. 4,234,278, Cl. 410-69.000.
Harson, Samuel E., to Manchem Limited. Complex organo-metallic compounds of boron or phosphorus. 4,234,496, Cl. 260-403.000.
Hart, Edwin R., to Seven-H Corporation. Method of processing corn. 4,234,614, Cl. 426-462.000.
Hartkopf, Heinz, to Th. Kieserling & Albrecht. Apparatus for transporting elongated cylindrical workpieces. 4,234,288, Cl. 414-745.000.
Hartl, Alfons E.: *See*—
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Hartlaub, Jerome T.; McDonald, Ray S.; and Shearon, Lawrence W., to Medtronic Inc. Multi-mode programmable digital cardiac pacemaker. 4,233,985, Cl. 128-419.0PG.
Hartley, Frederick; Slocum, Keith; Newquist, John; and Moga, Nicholas, to United States of America, Navy. 76MM Rammable practice cartridge. 4,233,902, Cl. 102-41.000.
Hartley, William F.: *See*—
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Hartman, David K.: *See*—
Anthony, Thomas R.; Cline, Harvey E.; Hartman, David K.; and Chang, Mike F., 4,233,934, Cl. 118-500.000.
Hartman, John: *See*—
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Hartman & Lammle GmbH & Co. KG, Firma: *See*—
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Hartman, Richard L., to United States of America, Army. Logarithmic lock-in amplifier. 4,234,851, Cl. 328-145.000.
Harwood, Robert G.: *See*—
Bowen, Terry P.; Hoover, Charles D.; Ferdon, Gilbert D.; and Harwood, Robert G., 4,233,724, Cl. 29-428.000.
Hashimoto, Masashi; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; and Hagiwara, Daijiro, to Fujisawa Pharmaceutical Company, Limited. Cephalosporin analogues and processes for the preparation thereof. 4,234,724, Cl. 544-90.000.
Hassander, Mats S. O.: *See*—
Ryrfors, Lars-Olof; and Hassander, Mats S. O., 4,234,467, Cl. 260-29.70H.
Hassler, Hedvig E. B.: *See*—
Kihlstedt, Per G.; Hassler, Hedvig E. B.; and Odeen, Kai, 4,234,380, Cl. 162-152.000.
Hauff, Joe. Utility platform. 4,234,284, Cl. 414-462.000.
Hauff, Wolfgang; and Tidland, John W. Portable air filtering and breathing assist device. 4,233,972, Cl. 128-205.120.
Hausler Scientific Instruments (Proprietary) Limited: *See*—
Bisset, Claude O., 4,233,741, Cl. 33-1.00N.
Hawker Siddeley Dynamics Engr., Inc.: *See*—
Thompson, Lionel R. F., 4,234,882, Cl. 343-14.000.
Hawkins, David J. D., to Constance, Robin Justice. Spit roasting apparatus and the spit roasting of roastable foodstuffs. 4,233,892, Cl. 99-421.00M.
Hay, Robert A., II; and St. Louis, Harold E., to Dow Chemical Company, The. Mixing method and container therefor. 4,234,447, Cl. 252-301.10W.
Hayashi, Masaki; Ohuchida, Shuichi; and Arai, Yoshinobu, to Ono Pharmaceutical Co. Ltd. 6,9-Nitrilo(imino)-prostaglandin analogues. 4,234,597, Cl. 424-274.000.
Hayashi, Yoshio: *See*—
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Hayes, Fay A.; and Hayes, Leonard L. Gasket feeding apparatus for an inplace gasket belling machine. 4,234,301, Cl. 425-392.000.
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Haynes, Freddie J. Fireplace system. 4,233,956, Cl. 126-121.000.
Haynes, Harvey H. Pressure differential seafloor corer-carrier. 4,234,046, Cl. 175-6.000.
Haynes, John K., Jr.: *See*—
McKenna, Lawrence W., Jr.; Finkelstein, Ronald S.; and Haynes, John K., Jr., 4,234,660, Cl. 428-411.000.
Haynes, Joseph E. Shoe with reflecting means. 4,233,760, Cl. 36-137.000.
HBTI: *See*—
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Flick, Francis S., 4,233,743, Cl. 33-143.00C.
Heden, Carl-Goran. Climate-controlled building construction. 4,233,958, Cl. 126-424.000.
Hefner, Robert E., Jr., to Dow Chemical Company, The. Phosphate beneficiation process. 4,234,414, Cl. 209-166.000.
Hegemann, Karl-Rudolf: *See*—
Weissert, Helmut; Niess, Theodor; and Hegemann, Karl-Rudolf, 4,234,335, Cl. 75-41.000.
Hehr International, Inc.: *See*—
Roe, Norman E., 4,233,781, Cl. 49-504.000.
Heiman, Frederic P., to Mars, Inc. Vending control apparatus. 4,234,070, Cl. 194-1.00N.
Hein, Paul R.; Evans, James A.; and Yang, Michael W., to W. R. Grace & Co. Polythiol effect curable polymeric composition. 4,234,676, Cl. 430-286.000.
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Helding, James R. Box closing machine. 4,233,798, Cl. 53-76.000.
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Hendrischk, Wolfgang; Noite, Gerhard; and Schrader, Gerhard, to Mannesmann Aktiengesellschaft. Printer. 4,234,261, Cl. 400-621.000.
Hendy, Brian N., to Imperial Chemical Industries Limited. Oriented polyolefin film. 4,234,664, Cl. 428-520.000.
Heni, Wolfgang; and Wolf, Peter, to Bellaplast GmbH. Apparatus for moving lightweight articles. 4,233,868, Cl. 83-126.000.
Henkel, Albert, legal representative: *See*—
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Wegener, Ingo; Glasl, Johann; and Werdehausen, Achim, 4,234,444, Cl. 252-174.220.
Hennenfent, Rex E. Livestock farrowing apparatus. 4,233,940, Cl. 119-20.000.
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Henry, Jean M.: *See*—
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Henschel, John P., to Minnesota Mining and Manufacturing Company. Optical signal transmitter. 4,234,967, Cl. 455-603.000.
Hensley, Steve L., to Pennwalt Corporation. Cryogenic fluid transfer line. 4,233,816, Cl. 62-55.000.
Hentrich, Hans-Jurgen: *See*—
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Hepworth, Malcolm T.; and Laferty, John M., to Amax Inc. Membrane process for separating contaminant anions from aqueous solutions of valuable metal anions. 4,234,393, Cl. 204-1.500.
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Robinson, Anderson E., Jr., 4,234,364, Cl. 149-19.400.
Hergaux, Claude. Cover for waste container. 4,234,096, Cl. 220-1.00T.
Hermann Berstorff Maschinenbau GmbH: *See*—
Spielhoff, Horst, 4,234,298, Cl. 425-186.000.
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Nitrogen bridgehead compounds having anti-allergic effect. 4,234,586, Cl. 424-251.000.
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Herring, James A.: *See*—
Martin, William F., 4,234,074, Cl. 198-558.000.
Herrington, F. John, Jr., to Mobil Oil Corporation. Flow distribution valve system for control of extrusion from multiple die orifices. 4,234,018, Cl. 138-45.000.
Herrmann, John C. Safe door. 4,233,913, Cl. 109-59.00T.
Herron, Lester W.; Master, Raj N.; and Tummala, Rao R., to International Business Machines Corporation. Method of making multilayered glass-ceramic structures having an internal distribution of copper-based conductors. 4,234,367, Cl. 156-89.000.
Hersom, Albert C.; Brittain, John E.; and Darlington, Raymond, to Societe d'Assistance Technique pour Produits Nestle S.A. Sterilization of particulate solid materials. 4,234,537, Cl. 422-26.000.
Hesketh, Bernard; and Pumphrey, Nicholas W. J., to Imperial Chemical Industries Limited. Electrode for electrochemical processes. 4,234,405, Cl. 204-290.00F.
Hesse, Robert H.: *See*—
Barton, Derek H. R.; and Hesse, Robert H., 4,234,515, Cl. 564-114.000.
Hevey, Richard C., to FMC Corporation. Device for delivering measured quantities of reagents into assay medium. 4,234,316, Cl. 23-230.00R.
Hevey, Richard C.; Malmros, Mark K.; and Petko, Wayne W., to Calbiochem-Behring Corp. Method for terminating a peroxidase catalyzed reaction. 4,234,680, Cl. 435-7.000.
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Allen, Mark S., 4,234,845, Cl. 324-83.00D.

Crilly, William J., Jr., 4,234,849, Cl. 328-46.000.
Jessen, Kenneth C., 4,233,873, Cl. 83-652.000.
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Hexcel Corporation: *See*—
Patz, Gary L.; and Davenport, Donald E., 4,234,648, Cl. 428-245.000.
Heytmeijer, Herman R., to Westinghouse Electric Corp. Circuit board having conductor runs resistant to formation of non-conductive localized areas and method. 4,234,304, Cl. 431-359.000.
Hickey, Glen A. External female catheter. 4,233,978, Cl. 128-295.000.
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Higgins, John T.; and Hildred, Gordon C., to Cominco Ltd. Process for granulation of sulfur. 4,234,318, Cl. 23-293.00S.
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Hill, Horace E.: *See*—
Benson, Richard L.; Hill, Horace E.; and Soderberg, Mark S., 4,234,277, Cl. 408-226.000.
Hinrichs, Leslie W. Chainsaw accessory. 4,233,739, Cl. 30-383.000.
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Hirano, Mikio; and Horiuchi, Susumu, to Hitachi, Ltd. Method and apparatus for treating radioactive waste. 4,234,448, Cl. 252-301.10W.
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Bernauer, Karl; Link, Helmut; and Stohler, Harro, 4,234,736, Cl. 548-314.000.
Chodnekar, Madhukar S.; Loeliger, Peter; Schwieter, Ulrich; Pfiffner, Albert; Suchy, Milos; and Zurflun, Rene, 4,234,598, Cl. 424-278.000.
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Gorgens, Richard A., 4,234,932, Cl. 364-900.000.
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Van Egmond, Jacobus H.; and Lichtenveldt, 4,234,390, Cl. 202-262.000.
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Horino, Kunio, to Tokico Ltd. Accumulator. 4,234,016, Cl. 138-30.000.
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Hoshall, Tom C. Filter device for fibrous materials. 4,234,274, Cl. 406-93.000.
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Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.
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McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., 4,234,399, Cl. 204-159.150.
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Mattson, Larry J., 4,233,977, Cl. 128-283.000.
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Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, 4,234,808, Cl. 310-49.00R.
Hudson, Sharon J., Jr., to Sharon Manufacturing Company. Oil separator device. 4,234,328, Cl. 55-447.000.
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Calhoun, Donald F.; and Bennett, Barry, 4,234,888, Cl. 357-45.000.
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Hund, Franz: *See*—
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Hurd, Robert L.; and MacGregor, Donald C. Chain driven cutting bucket for use in deep mining. 4,234,233, Cl. 299-34.000.
Hurst, George P.; and Svensson, Assar N., to Skega Aktiebolag. Wear lining. 4,234,291, Cl. 415-174.000.
Hurst, Robert G.; and Pinner, Alan L., to Protim International Limited. Apparatus for the treatment of timber. 4,233,929, Cl. 118-50.000.
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Davis, Wilbur M.; Sawyer, Bobby G.; Nichols, John A.; and Husman, John F., 4,233,803, Cl. 56-14.900.
Hutten, James E., to American Thermometer Co., Inc. Combined display package and article storage case. 4,234,084, Cl. 206-306.000.
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Hutton, Ronald E.: *See*—
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ICI Americas Inc.: *See*—
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Iida, Yoshimi, to Nippon Oil Seal Industry Co., Ltd. Roll neck sealing device. 4,234,196, Cl. 277-12.000.
Iinuma, Kazuhiro, to Tokyo Shibaura Electric Co., Ltd. Ultrasound transmitting or receiving apparatus. 4,234,940, Cl. 367-105.000.
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Bjorklund, Lowell L.; Berg, Ramon A.; and Friedland, George A., 4,233,880, Cl. 85-41.000.
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Imai, Katsuyuki: *See*—
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IMI Norgren Limited: *See*—
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Imperial Chemical Industries Limited: *See*—
Atherton, John H.; and Hodgkinson, Ian, 4,234,478, Cl. 260-141.000.
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Hesketh, Bernard; and Pumphrey, Nicholas W. J., 4,234,405, Cl. 204-290.00F.
Jones, Derrick F.; and Yellin, Tobias O., 4,234,735, Cl. 548-198.000.
McIndoe, Christopher J., 4,234,747, Cl. 568-857.000.
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Inada, Shigeru: *See*—
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Herron, Lester W.; Master, Raj N.; and Tummala, Rao R., 4,234,367, Cl. 156-89.000.
Jeremiah, Thomas L.; and Pezdirtz, Karl F., 4,234,955, Cl. 371-51.000.
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Schreiner, Kenneth E., 4,234,935, Cl. 365-15.000.
Vanderslice, Wilbur B., Jr., 4,234,887, Cl. 357-24.000.
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Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,234,463, Cl. 252-522.00R.
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Weiler, Rolf; and Bohm, Peter, 4,233,884, Cl. 91-369.00B.
Ivanova, Latinka T.: *See*—
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Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, 4,233,944, Cl. 123-416.000.
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Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, 4,234,262, Cl. 400-175.000.
J. M. Voith GmbH: *See*—
Schiel, Christian, 4,234,382, Cl. 162-263.000.
Jackula, Michael J.; and Ziegler, Hans J., to Reliable Electric Company. Preterminated block system and method of installing same. 4,234,756, Cl. 174-38.000.
Jacuzzi Whirlpool Bath, Inc.: *See*—
Janosko, Richard L.; and D'Innocente, Ralph, 4,233,694, Cl. 4-542.000.
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Meyer, Rolf; and Schonmeier, Herbert, 4,233,869, Cl. 83-500.000.
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Birum, Gail H.; and Jansen, Richard F., 4,234,696, Cl. 521-108.000.
Jansen, Robert A. Outdoor Bar-B-Q smoker and grill. 4,233,890, Cl. 99-340.000.
Jarman, Trevor R.: *See*—
Righelato, Renton C.; and Jarman, Trevor R., 4,234,688, Cl. 435-101.000.
Jasko, James J.; and Zielinski, Richard J., to SCM Corporation. Lipoidal compositions, hard butter components, and improvement in process for making the latter. 4,234,618, Cl. 426-607.000.
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Breslow, Jeffrey D.; and Jaworski, Eugene, 4,234,181, Cl. 273-1.00R.
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Jeffkin, Ruth: *See*—
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Twyman, Noel H.; and Jenkins, Robert F., 4,234,283, Cl. 414-171.000.
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Jensen, Dale H.: *See*—
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 4,233,920, Cl. 114-56.000.
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Gjerde, Trygve; Vigander, Kjell; Jenssen, Dag N.; and Hjertas, Bjorn, 4,234,270, Cl. 405-202.000.
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Jessen, Kenneth C., to Hewlett-Packard Company. Permanent magnetic hold down for steel rule dies. 4,233,873, Cl. 83-652.000.
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Jockel, Heinz; Moller, Friedrich W.; Renner, Hans J.; and Krumm, Hagen, to Metallgesellschaft Aktiengesellschaft. Process of producing a reducing gas. 4,234,451, Cl. 252-373.000.
Jocteur, Robert, to Societe Industrielle de Liaisons Electriques-Silec. Method for extruding a cross-linked material. 4,234,531, Cl. 264-174.000.
Johansson, Birger, to ASEA Aktiebolag. Transformer with offset side wall-mounted on-load tap changer. 4,234,864, Cl. 336-90.000.
John, Alfryn I.; and Moxham, Jack H. Self-locking adjustable support devices. 4,234,151, Cl. 248-354.00S.
Johns Hopkins University, The: *See*—
Marsh, David G., 4,234,569, Cl. 424-91.000.
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Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, 4,234,836, Cl. 318-480.000.
Johnson, Roy B.: *See*—
Ristvedt, Victor G.; and Johnson, Roy B., 4,234,003, Cl. 133-3.00A.
Johnson, Russell W.: *See*—
Homeier, Edwin H.; and Johnson, Russell W., 4,234,455, Cl. 252-430.000.
Johnson, Steven A. Heat storage apparatus and method. 4,233,960, Cl. 126-430.000.
Johnson, William R.: *See*—
Morgan, Chester S.; and Johnson, William R., 4,234,338, Cl. 75-235.000.
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Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., 4,234,596, Cl. 424-274.000.
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Jolley, Michael R. J.: *See*—
Groenenboom, Cornelis J.; Huysmans, Willem G. B.; Burley, Joseph W.; Hutton, Ronald E.; and Jolley, Michael R. J., 4,234,501, Cl. 260-429.700.
Jones, Derrick F.; and Yellin, Tobias O., to Imperial Chemical Industries Limited; and ICI Americas Inc. Guanidino imidazoles and thiazoles. 4,234,735, Cl. 548-198.000.
Jones, Evan A., to UOP Inc. Guard-bed vapor bypass to overcome pressure drop in mixed-phase reactions. 4,234,314, Cl. 23-230.00A.
Jones, Gordon H.: *See*—
Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., 4,234,571, Cl. 424-177.000.
Jones, Robert S. Attachments in model airplanes. 4,233,773, Cl. 46-76.00R.
Jorgensen, Carsten, to Copco, Inc. Gridworks storage system. 4,234,094, Cl. 211-88.000.

Jost, Ronald C.: *See—*
Bickley, Robert H.; Briggs, Ronald C.; and Jost, Ronald C., 4,234,965, Cl. 455-285.000.

Jung, Check K.; and Whalen, Harold E., to Sperry Corporation. Gasdynamic solar powered laser. 4,234,856, Cl. 331-94.50P.

Junkers, John K. Hydraulic wrench. 4,233,865, Cl. 81-57.440.

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Kawashima, Hirofumi, 4,234,812, Cl. 310-361.000.
Komaki, Shojiro; and Kaneko, Noboru, 4,234,944, Cl. 368-72.000.

Kabushiki Kaisha Kyoritsu Seisakujo: *See—*
Take, Hisao, 4,233,951, Cl. 123-625.000.

Kabushiki Kaisha Sato Kenkyusho: *See—*
Sato, Yo, 4,233,900, Cl. 101-288.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Nakane, Masao; and Nishii, Masahiko, 4,234,057, Cl. 187-9.00E.

Kadelbach, Volker; Will, Gerhard; and Sauer, Joseph, to Robert Bosch GmbH. Control system for automotive automatic transmission with emergency operation feature. 4,233,860, Cl. 74-752.00A.

Kadota, Takumi: *See—*
Umemura, Sumio; Matsui, Kanenobu; Ikeda, Yoshinari; Masunaga, Katsuro; and Kadota, Takumi, 4,234,740, Cl. 560-81.000.

Kaelin, Oscar J.; and Mathews, Richard H., to GTE Sylvania Incorporated. Noise adaptive correlator. 4,234,883, Cl. 343-100.0CL.

Kaga, Hideharu: *See—*
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,234,534, Cl. 264-328.800.

Kagayama, Michiko: *See—*
Hirayama, Masami; Nakata, Tadataka; and Kagayama, Michiko, 4,234,450, Cl. 252-314.000.

Kahn, Marvin L.; and Eapen, Kuttikandathil E., to Rich Products Corporation. Soft intermediate-moisture frozen puddings and fillings. 4,234,611, Cl. 426-321.000.

Kaji, Hidehiko: *See—*
Ohta, Yuzo; Sugi, Norio; Isogai, Osamu; Hirai, Takahiro; and Kaji, Hidehiko, 4,234,469, Cl. 260-42.460.

Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, to Kawasaki Steel Corporation. Apparatus for producing low-oxygen iron-base metallic powder. 4,234,168, Cl. 266-128.000.

Kakenyaku Kako Kabushiki Kaisha: *See—*
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.

Kako, Noritoshi; Yamane, Yasukuni; and Suzuki, Chuji, to Sharp Kabushiki Kaisha. Flat panel television receiver implemented with a thin film EL panel. 4,234,821, Cl. 315-169.300.

Kalina, Alexander I. Method and apparatus for loading and unloading pipeline capsules. 4,234,271, Cl. 406-1.000.

Kamiya, Kunio; Yusa, Hideo; Kitamura, Masao; Takeshima, Masaki; and Ishidate, Toshio, to Hitachi, Ltd.; and Nippon Engelhard Ltd. Iodine adsorbent. 4,234,456, Cl. 252-438.000.

Kamoda, Tamotsu: *See—*
Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; Yasukawa, Teruo; and Kamoda, Tamotsu, 4,234,617, Cl. 426-557.000.

Kamp, Heinz, to W. Schlafhorst & Co. Device for automatically removing a coil from a spindle of a ring spinning frame or a ring twister. 4,233,810, Cl. 57-270.000.

Kampe, Wolfgang: *See—*
Winter, Werner; Friebe, Walter-Gunar; Kampe, Wolfgang; Roesch, Andronik; and Wilhelms, Otto-Henning, 4,234,585, Cl. 424-250.000.

Kanaiwa, Kiyoshi; and Matsumoto, Kozo, to Canon Kabushiki Kaisha. Information output apparatus for putting out a character dot pattern. 4,234,931, Cl. 364-900.000.

Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, to Kakenyaku Kako Kabushiki Kaisha. Proteinic active substances. 4,234,570, Cl. 424-177.000.

Kaneko, Noboru: *See—*
Komaki, Shojiro; and Kaneko, Noboru, 4,234,944, Cl. 368-72.000.

Kaplan, Donald A.; and Wilcox, Gary L., to University of California, The Regents of the. Horizontal slab gel electrophoresis. 4,234,400, Cl. 204-180.00G.

Kappler, Fritz-Robert; and Seiler, Claus-Dietrich, to Dynamit Nobel Aktiengesellschaft. Method of preparing aminoalkylsilanes. 4,234,502, Cl. 556-413.000.

Kappler, Fritz-Robert; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Method of preparing gamma aminopropyl alkoxy silanes. 4,234,503, Cl. 556-413.000.

Karch, John A.: *See—*
Burk, Emmett H., Jr.; Yoo, Jin S.; Sun, Jui-Yuan; and Karch, John A., 4,234,452, Cl. 252-419.000.

Karrer, Friedrich, to Ciba-Geigy Corporation. 2,2,6,6-Tetramethylpiperidine derivatives. 4,234,734, Cl. 546-188.000.

Kartchner, Mark M.: *See—*
McRae, Lorin P.; and Kartchner, Mark M., 4,233,980, Cl. 128-325.000.

Kataoka, Hiroyoshi: *See—*
Takahashi, Mitsuru; Omori, Yukio; Ikeda, Shuji; and Kataoka, Hiroyoshi, 4,234,466, Cl. 260-17.00A.

Katayama, Hironobu: *See—*
Nakagawa, Shozo; Yokoyama, Katsuya; and Katayama, Hironobu, 4,234,898, Cl. 360-41.000.

Kato, Hajime; and Ogata, Yasuhiro, to Fuji Photo Film Co., Ltd. Recording sheet. 4,234,212, Cl. 282-27.500.

Katsukura, Kazutada: *See—*
Sekiguchi, Kouichi; Takematsu, Hikaru; and Katsukura, Kazutada, 4,234,765, Cl. 179-99.00M.

Katzen, Stanley J.: *See—*
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,234,453, Cl. 252-428.000.
Rekers, Louis J.; and Katzen, Stanley J., 4,234,709, Cl. 526-100.000.

Kauffeldt, Horst. Apparatus for cleaning of large scale textile coverings, especially carpets and wall to wall carpeting. 4,233,706, Cl. 15-300.00A.

Kaukeinen, Joseph Y.; and Rockafellow, Duane A., to Eastman Kodak Company. Reducible metal salt-dry electrographic visible image recording process. 4,234,670, Cl. 430-52.000.

Kautetzky, Anton; and Muller, Otto, to Kraftwerk Union Aktiengesellschaft. Attachment for screw-tightening devices, preferably for reactor pressure vessels. 4,233,727, Cl. 29-560.000.

Kavadias, Gerry, to Bristol-Myers Company. 9-Oxobenzomorphan process. 4,234,731, Cl. 46-97.000.

Kawaguchi, Hideo: *See—*
Yamagisi, Kikuo; Okuyama, Hiroshi; and Kawaguchi, Hideo, 4,234,300, Cl. 425-363.000.

Kawai, Hisasi: *See—*
Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, 4,233,944, Cl. 123-416.000.

Kawakami, Hiromi: *See—*
Hongu, Masayuki; Kawakami, Hiromi; and Tokuhara, Masaharu, 4,234,963, Cl. 455-204.000.

Kawakami, Kanji: *See—*
Sato, Hideo; Kawakami, Kanji; and Nishihara, Motohisa, 4,233,848, Cl. 73-727.000.

Kawamoto, Tamio: *See—*
Toyota, Hiroshi; Kawamoto, Tamio; and Takehiro, Etsusou, 4,234,066, Cl. 192-0.092.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Uozumi, Yukio; and Yagi, Masaharu, 4,234,065, Cl. 191-29.00R.

Kawasaki Steel Corporation: *See—*
Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, 4,234,168, Cl. 266-128.000.

Kawashima, Hirofumi, to Kabushiki Kaisha Daini Seikosha. Thickness-width shear quartz crystal vibrator. 4,234,812, Cl. 310-361.000.

Kawashima, Nobuo: *See—*
Ohkawa, Mikio; and Kawashima, Nobuo, 4,234,771, Cl. 200-144.00B.

Kawashima, Yutaka: *See—*
Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, 4,233,944, Cl. 123-416.000.

Kawazoe, Michio. Tilting adjusting mechanism for a camera tripod. 4,234,149, Cl. 248-184.000.

Kay, Francis X. Valves for the control of pressure fluid. 4,234,162, Cl. 251-175.000.

Keegan, Richard E.: *See—*
Phillips, Barry A.; Spitler, Keith G.; and Keegan, Richard E., 4,234,745, Cl. 568-614.000.

Keegan, Robert R. Modular chess set. 4,234,188, Cl. 273-290.000.

Kehr, Dieter; and Goebell, Juergen, to Minnesota Mining and Manufacturing Company. Dielectric material for influencing electric fields, and stress control devices made therefrom. 4,234,439, Cl. 252-63.200.

Keith, Charles H.: *See—*
Miano, Ralph R.; and Keith, Charles H., 4,233,993, Cl. 131-2.000.

Kelderman, Hendrik C.: *See—*
Van Berkel, Johannes; and Kelderman, Hendrik C., 4,234,512, Cl. 568-420.000.

Keller, Douglas V., Jr.: *See—*
Smith, Clay D.; and Keller, Douglas V., Jr., 4,234,232, Cl. 299-5.000.

Keller, Teddy M.; and Griffith, James R., to United States of America, Navy. Polyphthalocyanine resins. 4,234,712, Cl. 528-9.000.

Kelley, Carl S., to Phillips Petroleum Company. Temperature control of exothermic reactions. 4,234,410, Cl. 208-57.000.

Kellner, Eckhard: *See—*
Kemmer, Josef; and Kellner, Eckhard, 4,234,831, Cl. 318-115.000.

Kellwood Company: *See—*
Conner, William R., Jr., 4,234,135, Cl. 242-56.00R.

Kelly, Donald A. Suspended, hot-box solar collectors. 4,233,961, Cl. 126-436.000.

Kelly, Robert C., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-9-deoxy-6,9α-epoxymethano-5,6-didehydro-PGF$_1$ compounds. 4,234,492, Cl. 260-345.200.

Kelly, Robert C., to Upjohn Company, The. 9-Deoxy-6,9α-epoxymethano-5,6-didehydro-PGF$_1$, amide. 4,234,493, Cl. 260-345.200.

Kelsey-Hayes Company: *See—*
Rozmus, Walter J., 4,233,720, Cl. 29-407.000.

Kemmer, Josef; and Kellner, Eckhard. Compound rotary and/or linear motor. 4,234,831, Cl. 318-115.000.

Kemper, Yves J., to Vadetec Corporation. Infinitely variable transmission unit and method. 4,233,851, Cl. 74-191.000.

Kemper, Yves J., to Vadetec Corporation. Infinitely variable transmission unit and system incorporating same. 4,233,859, Cl. 74-690.000.

Kenly, William L., V; Grefe, William O.; and Lawrence, Walter H., to Pollution Control Industries, Inc. Ozone generator. 4,234,800, Cl. 250-540.000.

Kenma, Shigeyuki: *See—*
Onuki, Keiichi; Nakagawa, Tohru; and Kenma, Shigeyuki, 4,234,523, Cl. 261-41.00D.

Kenny, Neal S., to Corning Glass Works. Solar energy collector. 4,233,957, Cl. 126-443.000.

Kern, Rene: *See*—
Deleens, Gerard; Guerin, Bernard; and Kern, Rene, 4,234,184, Cl. 273-235.00R.

Kerscher, Albert; and Furtner, Walter, to Knorr-Bremse GmbH. Mechanical release mechanism for a spring-loaded brake cylinder. 4,234,062, Cl. 188-170.000.

Keystone Consolidated Industries, Inc.: *See*—
Dauenbaugh, Robert L., 4,233,828, Cl. 70-363.000.

Kidd, Derek J.: *See*—
Sewell, Richard B. H.; and Kidd, Derek J., 4,234,637, Cl. 428-131.000.

Kidd, H. Keith: *See*—
Langley, Lawrence W.; and Kidd, H. Keith, 4,234,838, Cl. 318-696.000.

Kiddie Products, Inc.: *See*—
Panicci, Richard L., 4,233,714, Cl. 24-201.00R.

Kihlstedt, Per G.; Hassler, Hedvig E. B.; and Odeen, Kai, to Advanced Mineral Research AB. Polymeric silicate material and a method of manufacturing the same. 4,234,380, Cl. 162-152.000.

Kijima, Yasuhiko: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; and Miyauchi, Yuh, 4,234,733, Cl. 546-174.000.

Kikuchi, Shoji: *See*—
Yoshimoto, Shinji; Fujiwhara, Mitsuto; Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Nakagawa, Satoshi, 4,234,678, Cl. 430-564.000.

Kilbourn, Edward E.: *See*—
Weir, W. David; and Kilbourn, Edward E., 4,234,575, Cl. 424-204.000.

Killam, H. Scott, to Rohm and Haas Company. Fibrous material made with polymers stabilized by polymerizable vinyl benzyltrialkyl ammonium salt surfactant. 4,234,381, Cl. 162-158.000.

Kimata, Ikukazu: *See*—
Motegi, Masahiko; Kimata, Ikukazu; and Fujita, Saburo, 4,234,532, Cl. 264-235.800.

Kimerling, Lionel C.: *See*—
Celler, George K.; Kimerling, Lionel C.; Leamy, Harry J.; Poate, John M.; and Rozgonyi, George A., 4,234,358, Cl. 148-1.500.

Kimura, Takashi: *See*—
Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; Yasukawa, Teruo; and Kamoda, Tamotsu, 4,234,617, Cl. 426-557.000.

Kimura, Takeo: *See*—
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,234,679, Cl. 430-619.000.

Kindelspire, Thomas J., to General Electric Company. Method of assembling a relay device. 4,233,732, Cl. 29-881.000.

King, Christopher D.; and Bowman, Noel T., to King, Christopher Duff; King, Sally; and Bowman, Noel Trevor. Battery charging. 4,234,839, Cl. 320-36.000.

King, Christopher Duff: *See*—
King, Christopher D.; and Bowman, Noel T., 4,234,839, Cl. 320-36.000.

King, Rendall N.: *See*—
Park, Dong-Sil; Breiter, Manfred W.; and King, Rendall N., 4,234,668, Cl. 429-163.000.

King, Sally: *See*—
King, Christopher D.; and Bowman, Noel T., 4,234,839, Cl. 320-36.000.

King, William M.: *See*—
Berdan, Betty L.; and King, William M., 4,234,395, Cl. 204-12.000.

Kinoshita, Tsuneo; Sato, Kazuyuki; and Soneoka, Ryusuke, to Tokyo Shibaura Denki Kabushiki Kaisha. Tester for electronic engine control systems. 4,234,921, Cl. 364-424.000.

Kintner, Edwin K. Valve. 4,234,015, Cl. 137-625.180.

Kirchner, Gerhard: *See*—
Koller, Horst; Hartl, Alfons E.; and Kirchner, Gerhard, 4,234,516, Cl. 568-341.000.

Kiriazaros, Kiriazis, to Maschinenfabrik Andritz Aktiengesellschaft. Bearing for heavy steel drums, in particular decorticating drums. 4,234,237, Cl. 308-26.000.

Kirilishin, Vsevolod P. Binder for chemically resistant concrete and process for producing this binder. 4,234,347, Cl. 106-286.700.

Kirkbride, Chalmer G. Sulfur removal from crude petroleum. 4,234,402, Cl. 204-162.00R.

Kirkpatrick, John W.; and Mower, Lawrence N., to Standard Oil Company (Indiana). Direct combustion stimulation of a producing well. 4,234,042, Cl. 166-261.000.

Kishi, Hitotoshi: *See*—
Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, 4,234,305, Cl. 432-59.000.

Kissel, Karl-Friedrich: *See*—
Fritz, Rolf; and Kissel, Karl-Friedrich, 4,234,384, Cl. 176-58.0PB.

Kitamura, Masao: *See*—
Kamiya, Kunio; Yusa, Hideo; Kitamura, Masao; Takeshima, Masaki; and Ishidate, Toshio, 4,234,456, Cl. 252-438.000.

Kitano, Yuichi; and Hirayama, Kaiichirou, to Tokyo Shibaura Denki Kabushiki Kaisha. Control systems for generators. 4,234,925, Cl. 364-494.000.

Kiwala, Jacob: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,234,463, Cl. 252-522.00R.

Klatt, William M.: *See*—
Bradley, William E.; Klatt, William M.; Kuyava, Charles C.; and Dreher, Robert D., 4,233,991, Cl. 128-733.000.

Klauke, Erich: *See*—
Sirrenberg, Wilhelm; Hammann, Ingeborg; Stendel, Wilhelm; and Klauke, Erich, 4,234,600, Cl. 424-310.000.

Klaxon S.A.: *See*—
Warnod, Bertrand A., 4,234,873, Cl. 340-509.000.

Klein, Jeshayahu. Portable microfilm viewer. 4,234,244, Cl. 350-241.000.

Kleinguenther, Robert A. Apparatus and process for treating wood and fibrous materials. 4,233,752, Cl. 34-9.500.

Klemm, Richard, to Siemens Aktiengesellschaft. Adaptive method and a radar receiver for suppression of disturbing portions of the Doppler spectrum. 4,234,880, Cl. 343-5.0FT.

Kline, Ralph L., to GTE Automatic Electric Laboratories Incorporated. Error density detector. 4,234,953, Cl. 371-5.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Berg, Josef, 4,234,292, Cl. 417-214.000.
Schleiermacher, Herbert, 4,233,854, Cl. 74-325.000.

Kluss, Karl K.: *See*—
Hornor, Harold G.; and Kluss, Karl K., 4,234,019, Cl. 138-109.000.

Knight, Roger E., to IMI Norgren Limited. Bowl for compressed air or gas filter or lubricator. 4,234,014, Cl. 137-557.000.

Knorr-Bremse GmbH: *See*—
Kerscher, Albert; and Furtner, Walter, 4,234,062, Cl. 188-170.000.

Kobayashi, Hidehiko: *See*—
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,234,679, Cl. 430-619.000.

Koch, Roderic M., to George Koch Sons, Inc. Nested container and base connection. 4,234,091, Cl. 206-499.000.

Kodama, Kenjiro: *See*—
Kusakabe, Hitoshi; Kodama, Kenjiro; Midorikawa, Yuichiro; Kuninaka, Akira; Misono, Haruo; and Soda, Kenji, 4,234,691, Cl. 435-191.000.

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Koenig, Fredrick, to General Electric Company. Apparatus and methods for making and using slot closure wedges at a coil injection station. 4,233,729, Cl. 29-596.000.

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Koike, Masahiko: *See*—
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Koike, Masaru, to Meinan Machinery Works, Inc. Veneer lathe. 4,234,024, Cl. 144-213.000.

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Koller, Horst; Hartl, Alfons E.; and Kirchner, Gerhard, to Atlantic Research Institute Limited. Method of isomerizing humulone to isohumulone by catalytic acceleration with metal salts. 4,234,516, Cl. 568-341.000.

Kollmorgen Technologies Corporation: *See*—
Bock, Francis X., 4,234,802, Cl. 328-171.000.
Langley, Lawrence W.; and Kidd, H. Keith, 4,234,838, Cl. 318-696.000.

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Komlos, Peter G.: *See*—
Flodin, Per G. M.; Komlos, Peter G.; and Ranby, Bengt G., 4,234,565, Cl. 424-33.000.

Konigsberg, Robert L.: *See*—
Yost, David J.; Arrow, Arthur; and Konigsberg, Robert L., 4,234,142, Cl. 244-3.210.

Konishiroku Photo Industry Co., Ltd.: *See*—
Iwama, Hideaki; Koyama, Mikio; Asano, Masao; and Tsuda, Yasuo, 4,234,671, Cl. 430-213.000.
Yoshimoto, Shinji; Fujiwhara, Mitsuto; Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Nakagawa, Satoshi, 4,234,678, Cl. 430-564.000.

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Kono, Masanori: *See*—
Chihara, Takeshi; and Kono, Masanori, 4,234,153, Cl. 248-475.00B.

Konrad, Charles E.; and Davis, Richard K., to General Electric Company. Battery state-of-charge indicator. 4,234,840, Cl. 320-48.000.

Kontz, Robert F., to Owens-Illinois, Inc. Apparatus for blow molding. 4,234,297, Cl. 425-174.400.

Korbanka, Helmut: *See*—
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Kordon, Moonish J. Apparatus for cultivating soil. 4,233,915, Cl. 111-6.000.
Kormendy, Miltiades, to Coal Industry (Patents) Limited. Engagement devices. 4,234,163, Cl. 254-108.000.
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Rywak, Donald E.; Griffith, James L.; Rhodes, Frederick D.; and Kovalsics, Otto, 4,234,106, Cl. 222-239.000.
Kowalik, Peter M.: *See*—
Cleaveland, Charles M.; and Kowalik, Peter M., 4,234,147, Cl. 248-74.00R.
Koyahata, Hirosi; and Suzuki, Nobuo. Stylus lead-in mechanism of record player. 4,234,194, Cl. 274-10.00R.
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Hishida, Hiroshi; Nakayama, Toshihiko; Koyama, Isao; and Wakabayashi, Hisao, 4,234,811, Cl. 310-348.000.
Koyama, Mikio: *See*—
Iwama, Hideaki; Koyama, Mikio; Asano, Masao; and Tsuda, Yasuo, 4,234,671, Cl. 430-213.000.
Kozar, Robert S.: *See*—
Rhodes, Cecil C.; and Kozar, Robert S., 4,234,429, Cl. 423-109.000.
Kraft, Inc.: *See*—
Krueger, Grant E., 4,234,615, Cl. 426-478.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Kautetzky, Anton; and Muller, Otto, 4,233,727, Cl. 29-560.000.
Kramer, Erich, to Bayer Aktiengesellschaft. Water-soluble azo dyestuffs. 4,234,480, Cl. 260-157.000.
Kranz, Max L., to Robertshaw Controls Company. Emergency escape breathing apparatus. 4,233,970, Cl. 128-201.280.
Krapcho, John; and Schwartz, Joseph, to E. R. Squibb & Sons, Inc. Naphthalenone derivatives and analogs. 4,234,602, Cl. 424-330.000.
Krauss-Maffei Aktiengesellschaft: *See*—
Seiler, Karl H., 4,233,906, Cl. 104-294.000.
Kreighbaum, William E.; and Comer, William T., to Mead Johnson & Company. 3-Indolyl-tertiary butylaminopropanols. 4,234,595, Cl. 424-274.000.
Kreiselman, Robert L.: *See*—
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., 4,234,538, Cl. 422-64.000.
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Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,234,453, Cl. 252-428.000.
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Krieger, David, to Emb-Tex Corporation. Process and apparatus for producing continuous embroidered fabrics. 4,233,916, Cl. 112-90.000.
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Petrov, Vyacheslav V.; and Krjuchin, Andrei A., 4,234,625, Cl. 427-74.000.
Kroenke, William J., to B. F. Goodrich Company, The. Dodecyl-1,12-diammonium dimolybdate and composition containing same. 4,234,473, Cl. 260-45.75R.
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Krueger, Grant E., to Kraft, Inc. Method for making large sized blocks of cheese. 4,234,615, Cl. 426-478.000.
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Jockel, Heinz; Moller, Friedrich W.; Renner, Hans J.; and Krumm, Hagen, 4,234,451, Cl. 252-373.000.
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Kuenzig, Ernest O.; and Pennino, Frank L., to Forest Mechanical Products Corp. Blow pin construction in a plastic bottle blow molding machine. 4,234,299, Cl. 425-292.000.
Kuerten, Heribert; Nagel, Otto; and Zehner, Peter, to BASF Aktiengesellschaft. Process for treating a liquid with a gas and for preventing the phase separation of unreacted gas and liquid, in a circulatory reactor. 4,234,560, Cl. 423-659.000.
Kuhl, LeRoy L.; and Thompson, Lester L. Vapor impermeable insulation facing construction. 4,233,791, Cl. 52-309.100.
Kuhn, Helmut; and Seiler, Kurt, to Hoechst Aktiengesellschaft. Process for the manufacture of a non-woven product having high shear strength and dimensional stability. 4,234,651, Cl. 428-290.000.
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Kumagai, Shigeto. Drain trap. 4,234,267, Cl. 405-42.000.
Kunimune, Kohichi; Hane, Teruaki; Inadomi, Seigo; and Furukawa, Yasuhiko, to Chisso Corporation. Heat-adhesive composite fibers. 4,234,655, Cl. 428-374.000.
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Kunita, Masao; Mizutani, Nagao; and Kurihara, Toshio, to Citizen Watch Co., Ltd. Device for feeding ink ribbon. 4,234,260, Cl. 400-219.300.
Kunkel, Heinrich: *See*—
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,233,855, Cl. 74-396.000.
Kuprianov, Alexandr V.: *See*—
Burenkov, Nikolai A.; Ioganson, Rikhard A.; Perchenok, Mark B.; Kuprianov, Alexandr V.; Chegodaev, Evgeny V.; and Chulin, Valentin I., 4,234,809, Cl. 310-105.000.
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Noda, Kenichi; Murakami, Hiroshi; and Kurata, Noboru, 4,233,717, Cl. 29-156.4WL.
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Nishimura, Yasushi; Uehara, Yasuo; and Haga, Tamio, 4,234,460, Cl. 252-447.000.
Kurihara, Toshio: *See*—
Kunita, Masao; Mizutani, Nagao; and Kurihara, Toshio, 4,234,260, Cl. 400-219.300.
Kuroda, Masahiko; and Ohsawa, Eiji, to Nissan Shatai Co., Ltd. Centralized alarm system for vehicles. 4,234,866, Cl. 340-52.00F.
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Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.
Kurosaki Refractories Co. Ltd.: *See*—
Horiguchi, Hiroshi; and Matsuo, Terumoto, 4,233,718, Cl. 29-157.00C.
Kusakabe, Hitoshi; Kodama, Kenjiro; Midorikawa, Yuichiro; Kuninaka, Akira; Misono, Haruo; and Soda, Kenji, to Yamasa Shoyu Kabushiki Kaisha. L-Lysine α-oxidase. 4,234,691, Cl. 435-191.000.
Kuyava, Charles C.: *See*—
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Kuzma, John J., Jr.: *See*—
McDonough, John C.; Rary, James K.; Birth, Arden; and Kuzma, John J., Jr., 4,234,370, Cl. 156-95.000.
Kuznetsov, Vladimir N. Dry film photosensitive resist. 4,234,675, Cl. 430-271.000.
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Ohta, Shigenori; and Watanabe, Kenji, 4,234,607, Cl. 426-56.000.
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Laferty, John M.: *See*—
Hepworth, Malcolm T.; and Laferty, John M., 4,234,393, Cl. 204-1.500.
LaFleur, Arthur E., to Custom Packaging Systems. Method of making a collapsible drum-type container. 4,233,888, Cl. 493-132.000.
Lafrenz, Joseph: *See*—
Cieslak, Richard F.; Balding, John V.; and Lafrenz, Joseph, 4,234,964, Cl. 455-226.000.
Lage, Frederick A. Shotgun shell. 4,233,903, Cl. 102-42.00R.
Lala, Louis A., to American Screen Printing Equipment Company. Long stroke attachment for a screen printing machine. 4,233,897, Cl. 101-123.000.
Lalaun, Jean-Pierre: *See*—
Catte, Raymond; Laputte, Robert; Moulies, Jean-Claude; and Lalaun, Jean-Pierre, 4,234,663, Cl. 428-517.000.
Lancellotti, William E. Sports helmet with face mask. 4,233,687, Cl. 2-9.000.
Landry, Archie C.: *See*—
Harshman, Ray E.; and Landry, Archie C., 4,234,278, Cl. 410-69.000.
Lane, William C., to Otis Engineering Corporation. Automatic inhaul winch system. 4,234,167, Cl. 254-291.000.
Lange, Julius; and Wagner, Gary L., to Ford Aerospace & Communications Corp. On-line bit error rate estimator. 4,234,954, Cl. 371-6.000.
Langlands, James W., to Langlands, Mary Frances Theresa. Method of bonding spaced sheets by molding resin therebetween. 4,234,533, Cl. 264-261.000.
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Langlands, James W., 4,234,533, Cl. 264-261.000.

Langley, Lawrence W.; and Kidd, H. Keith, to Kollmorgen Technologies Corporation. Incremental motion motor controller. 4,234,838, Cl. 318-696.000.
Lanham Machinery Company, Inc.: *See*—
Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., 4,234,281, Cl. 414-37.000.
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Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., 4,234,281, Cl. 414-37.000.
Lanter, Kent J.: *See*—
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Laputte, Robert: *See*—
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Larach, Simon; and Vilkomerson, David H. R., to RCA Corporation. Echocardiographic apparatus for myocardial disease diagnosis by A-wave quantification. 4,233,989, Cl. 128-661.000.
Larsen, Steven T.: *See*—
Guckel, Henry; and Larsen, Steven T., 4,234,361, Cl. 148-186.000.
Las, Roger. Device for marking an element of information. 4,234,187, Cl. 273-248.000.
Laseter, Douglas E. Material conveyor. 4,234,272, Cl. 406-64.000.
La Spina, Andrea; Dietrich, Werner; and Schliebs, Reinhard, to Bayer Aktiengesellschaft. Addition compounds which contain phosphorus and their use as catalysts for the production of foam resins which contain carbodiimide groups. 4,234,694, Cl. 521-107.000.
Lassig, Harry; and Grosshauser, Anton, to Fordertechnische Forschungsgesellschaft mbH. Load handling railraod vehicle. 4,234,287, Cl. 414-542.000.
Lastinger, William R. Heat exchange interface apparatus. 4,233,818, Cl. 62-224.000.
Lathem Time Recorder Co., Inc.: *See*—
Pipes, William F.; Millsap, Roy V.; McClure, Richard W.; and Hooper, Harrison G., 4,234,958, Cl. 375-107.000.
Latta, Laurence, Jr.; and Leonard, John B., Jr., to Chem-Crete Corporation. High strength modified asphalt paving composition. 4,234,346, Cl. 106-281.00R.
Lattrell, Rudolf; Bartmann, Wilhelm; and Gerhards, Hermann, to Hoechst Aktiengesellschaft. Substituted phenylpiperazine derivatives. 4,234,584, Cl. 424-250.000.
Laurel Bank Machine Co., Ltd.: *See*—
Uchida, Isamu; and Watanabe, Kenkichi, 4,234,002, Cl. 133-1.00A.
La Vance, Cecil N.; and Beale, Allan A., to Motorola, Inc. Method of introducing a baseline measurement into electronic positioning apparatus. 4,234,924, Cl. 364-460.000.
Lawrence, Frederick R., to Du Pont de Nemours, E. I., and Company. Catalytic nitration of aromatic compounds. 4,234,470, Cl. 568-939.000.
Lawrence, Walter H.: *See*—
Kenly, William L., V; Grefe, William O.; and Lawrence, Walter H., 4,234,800, Cl. 250-540.000.
Laws, William R.; and Reed, Geoffrey R., to Encomech Engineering Services Ltd. Storage of thermal energy. 4,233,959, Cl. 126-426.000.
Lawson, Gustaf R., to AMP Incorporated. Covering for T-tap terminals. 4,234,760, Cl. 174-138.00F.
LCG, Inc.: *See*—
Clifft, Dale L., 4,233,788, Cl. 52-127.000.
Leahy, Thomas; and Fenoli, John. Method for preventing freeze-up of musical instrument valves and other movable elements. 4,233,876, Cl. 84-388.000.
Leamy, Harry J.: *See*—
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Leblanc, Gilles. Footwear cleaning apparatus. 4,233,707, Cl. 15-311.000.
Lebost, Barry A. Fluid turbine. 4,234,289, Cl. 415-2.00R.
Le Brise, Raymond, to Societe Anonyme Francaise du Ferodo. Torsion damping assembly especially for a friction clutch plate assembly. 4,234,068, Cl. 192-106.200.
Leco Corporation: *See*—
Bredeweg, Roger L.; and Sitek, George J., 4,234,541, Cl. 422-78.000.
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., to Schering Corporation. Microbiological methylation of aminoglycosyl-aminoglycosides. 4,234,685, Cl. 435-80.000.
Lee, Chi-Long: *See*—
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Lee, Gim F., Jr.: *See*—
Abolins, Visvaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., 4,234,701, Cl. 525-68.000.
Lee, Minyoung; Szala, Lawrence E.; and DeVries, Robert C., to General Electric Company. Polycrystalline diamond body/silicon nitride substrate composite. 4,234,661, Cl. 428-446.000.
Lee, Peter D., to Governor & Company of the Bank of England. Document carrying a legible code, and method and apparatus for producing same. 4,234,214, Cl. 283-57.000.
Lefebvre, Fredrick L. Liquid level responsive control device. 4,234,785, Cl. 219-523.000.
Leftault, Charles J., Jr. Traction assembly for vehicle wheels. 4,234,028, Cl. 152-233.000.
LeGrow, Gary E., to Dow Corning Corporation. Curable solventless organopolysiloxane compositions. 4,234,713, Cl. 528-15.000.
Le-Hong, Son, to Compagnie de Signaux et d'Enterprises Electriques. Device for checking metal pieces, particularly coins. 4,234,071, Cl. 194-100.00A.
Leiboff, Teague N., to Northrop Corporation. Radiant energy quadrant detection device. 4,234,145, Cl. 244-3.160.
Leichtfried, Friedrich: *See*—
Hofbauer, Rupert; Leichtfried, Friedrich; and Svoboda, Josef, 4,234,206, Cl. 280-605.000.
Leistritz, Hans K. Gas discharge apparatus. 4,233,812, Cl. 60-320.000.
Leisure Lawn, Inc.: *See*—
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Leitch, George J., to MacGregor International S.A. Container and cover arrangement. 4,234,034, Cl. 160-193.000.
Leivenzon, Simon; and Leivenzon, Steven, to Firmaframe Nominees Proprietary Limited. Roller door and frame combination. 4,234,033, Cl. 160-133.000.
Leivenzon, Steven: *See*—
Leivenzon, Simon; and Leivenzon, Steven, 4,234,033, Cl. 160-133.000.
Lemelson, Jerome H. Modular toy. 4,233,778, Cl. 46-240.000.
Leo, John N. Fluoridation system. 4,234,425, Cl. 210-88.000.
Leonard, Henri, to Micro-Mega S.A. Device for locking a tool in a dental handpiece. 4,234,308, Cl. 433-127.000.
Leonard, John B., Jr.: *See*—
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Lepage, Jeanne L.: *See*—
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Lepage, Michel; and Lepage, Jeanne L. Paint metering tray for roller applications. 4,233,705, Cl. 15-257.060.
Lepretre, Marc V. A.: *See*—
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Letraset Corporation: *See*—
Scrutton, Simon L.; Shepherd, John V.; Thornley, John S.; and Sutton, Eric M., 4,234,673, Cl. 430-252.000.
Leuthard, Paul E. Porous ceramic dental filling insert. 4,234,310, Cl. 433-228.000.
Lever Brothers Company: *See*—
Lok, Cornelis M., 4,234,498, Cl. 260-410.700.
Lewallyn, Michael A. Carpet sample stacker. 4,234,282, Cl. 414-45.000.
Lewis, Katherine J.: *See*—
Blake, Stephen D.; and Lewis, Katherine J., 4,234,644, Cl. 428-204.000.
Lewis, Neal A., to Procter & Gamble Company, The. Robusta coffee. 4,234,613, Cl. 426-430.000.
LGZ Landis & Gyr Zug AG: *See*—
Fahlesson, Kjell T., 4,234,904, Cl. 361-165.000.
Halder, Mathis, 4,234,872, Cl. 340-365.00R.
Lichtenveldt: *See*—
Van Egmond, Jacobus H.; and Lichtenveldt, 4,234,390, Cl. 202-262.000.
Lidorenko, Nikolai S.; Litsenko, Tatyana A.; Potapov, Valery N.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S. Solar power unit. 4,234,354, Cl. 136-246.000.
Lieding, Calvin A., to Irrigation Specialties Company. Pop-up sprinkler. 4,234,125, Cl. 239-111.000.
Lien, Jih-Chang: *See*—
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Life Instruments Corporation: *See*—
Dick, Donald E.; Metz, Robert L.; RoJohn, D. Scott; and Elliott, Raymond D., 4,233,988, Cl. 128-660.000.
Lifeline Products, Inc.: *See*—
Marshall, James J., 4,234,686, Cl. 435-94.000.
Lightle, John R., to Dresser Industries, Inc. Axial balancing system for motor driven pumps. 4,234,293, Cl. 417-365.000.
Lilburn, Jennifer E., to Chevron Research Company. Fuel compositions containing deposit control additives. 4,234,321, Cl. 44-72.000.
Lill, Helmut: *See*—
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Lillibridge, Harold R., to Champion International Corporation. Reclosable envelope. 4,234,122, Cl. 229-77.000.
Linares, Robert C., to Allied Chemical Corporation. Growth of single crystal beryllium oxide. 4,234,376, Cl. 156-617.0SP.
Linderoth, Gustaf; and Wiberg, Karl-Gunnar, to ASEA Aktiebolag. Method of applying an insulation of cross-linked polymer on a cable conductor. 4,234,624, Cl. 427-55.000.
Lindsay, Geoffrey A., to B. F. Goodrich Company, The. Polymer compositions and a method for enhancement in phase compatibility of elastomers with relatively rigid polymers. 4,234,703, Cl. 525-211.000.
Linehan, Kevin L., to ICI Australia Limited. Process of manufacturing feed blocks and products thereof. 4,234,608, Cl. 426-72.000.
Link, Helmut: *See*—
Bernauer, Karl; Link, Helmut; and Stohler, Harro, 4,234,736, Cl. 548-314.000.
Lion Fat & Oil Co., Ltd., The: *See*—
Magari, Teruo; Sato, Toyoyuki; and Nakamura, Masayoshi, 4,234,465, Cl. 252-547.000.

Lithibar Company, The: *See*—
Donnelly, Bernard P.; and Van Slooten, Roland W., 4,234,280, Cl. 414-35.000.

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Lobach, James L.; Outteridge, David A. J.; and Colwell, Gary D., to Binks Manufacturing Company. Turbine pump. 4,234,290, Cl. 415-145.000.

Loch, Charles H.: *See*—
Barnes, Jocelyn T.; Hard, Chester A., III; Shelby, Billy L.; and Loch, Charles H., 4,234,912, Cl. 362-145.000.

Lock, Peter M.; and Webb, David R. Wound dressing materials. 4,233,969, Cl. 128-156.000.

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Loffelholz, Eberhard. Ski pole. 4,234,202, Cl. 280-820.000.

Lok, Cornelis M., to Lever Brothers Company. Preparation of glyceride esters. 4,234,498, Cl. 260-410.700.

Lombardo, Ralph M., Jr.: *See*—
Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., 4,234,919, Cl. 364-200.000.

Lonati, Francesco, to Costruzioni Meccaniche Lonati S.p.A. Knitting method and machine. 4,233,822, Cl. 66-14.000.

Lonati, Francesco, to Costruzioni Meccaniche Lonati S.p.A. Double-cylinder circular knitting machine. 4,233,823, Cl. 66-14.000.

Lonati, Francesco, to Costruzioni Meccaniche Lonati S.p.A. Control device for striper units in circular knitting machines. 4,233,826, Cl. 66-140.00R.

Long, William J.; Roberts, Larry W.; and Williams, H. Ross, to Amer-O-Matic Corporation. Envelope opener. 4,233,800, Cl. 53-381.00R.

Longinotti, Enrico. Prefabrication system for building walls. 4,234,634, Cl. 428-58.000.

Longsderff, Richard W.; and Henry, Dale V., to RCA Corporation. Alkali metal dispenser. 4,233,936, Cl. 118-726.000.

Looney, John H., to Xerox Corporation. Recirculating document handler configuration. 4,234,180, Cl. 271-3.100.

Lord Corporation: *See*—
McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., 4,234,399, Cl. 204-159.150.

Loreto, Wilfredo P., to AIT Industries, Inc. Lens edging apparatus. 4,233,784, Cl. 51-105.0LG.

Lotti, Nevio, to Sorma S.n.c. di Pieri-Lotti & C. Automatic apparatus for discharging loose products in bins. 4,234,279, Cl. 414-33.000.

Lowe, Bryan W. H.: *See*—
Woolcock, Alan; Lowe, Bryan W. H.; and Walters, Colin R., 4,234,861, Cl. 335-216.000.

Lower, William E.; Mitchell, Stephen C.; and Simpson, Jeremy F., to Rotex, Inc. Feed stream splitter for multiple deck screening machine. 4,234,416, Cl. 209-247.000.

Lube, Robert R.: *See*—
Gallanis, George P.; Spohr, Albert R.; and Lube, Robert R., 4,233,733, Cl. 30-43.920.

Luborsky, Fred E.: *See*—
Frischmann, Peter G.; Luborsky, Fred E.; and Tompkins, Russell E., 4,234,360, Cl. 148-121.000.

Lubowitz, Hyman R., to United States of America, Administrator U.S. Environmental Protection Agency. Solid waste encapsulation. 4,234,632, Cl. 428-2.000.

Lubrizol Corporation, The: *See*—
Meinhardt, Norman A.; and Davis, Kirk E., 4,234,435, Cl. 252-51.50A.

Lucas, Flordeliza F.; and Smernoff, Ronald B., to Analytical Products, Inc. Apparatus and method for fractionation of lipoproteins. 4,234,317, Cl. 23-230.00B.

Lucas Industries Limited: *See*—
Thomas, Roland M., 4,233,866, Cl. 82-1.00C.

Luparello, Pietro: *See*—
Busacca, Guido; Luparello, Pietro; Marranca, Lucio; and Sanfilippo, Michele, 4,234,855, Cl. 331-90.000.

Lutes, Georg F., Jr.: *See*—
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Lux, Gregory. Ski sail apparatus. 4,234,211, Cl. 280-810.000.

Lynn, James B.; Homberg, Otto A.; and Burcaw, Kenneth R., Jr., to Bethlehem Steel Corporation. Cooling naphthalene-bearing waters and gas streams. 4,234,389, Cl. 201-30.000.

M.A.N.-Roland Druckmaschinenfabrik Faber & Schleicher AG: *See*—
Rebel, Herbert, 4,233,899, Cl. 101-142.000.

MacGregor, Donald C.: *See*—
Hurd, Robert L.; and MacGregor, Donald C., 4,234,233, Cl. 299-34.000.

MacGregor International S.A.: *See*—
Leitch, George J., 4,234,034, Cl. 160-193.000.

Mackay, Frederick G.; and Mackay, Spencer L., to McGraw-Edison Company. Evaporative cooler. 4,234,526, Cl. 261-106.000.

Mackay, Spencer L.: *See*—
Mackay, Frederick G.; and Mackay, Spencer L., 4,234,526, Cl. 261-106.000.

MacLeod, John N.: *See*—
Krolski, Kenneth L.; and MacLeod, John N., 4,233,950, Cl. 123-630.000.

MacRae, Donald R.; and Gold, Richard G., to Bethlehem Steel Corporation. Arc control in plasma arc reactors. 4,234,334, Cl. 75-10.00R.

Maddestra, Robert; and Munn, David E., to Damon Corporation. Display stand. 4,234,148, Cl. 248-174.000.

Maekawa, Yasuo; Sekiguchi, Tsunetoshi; Waki, Masahiko; Koide, Hiroshi; Watanabe, Kisuke; Matsumura, Osamu; and Yamagata, Hisao, to Citizen Watch Co., Ltd. Watchglass fixing structure. 4,234,948, Cl. 368-291.000.

Magari, Teruo; Sato, Toyoyuki; and Nakamura, Masayoshi, to Lion Fat & Oil Co., Ltd., The. Detergent composition. 4,234,465, Cl. 252-547.000.

Maggs, Frederick A. P.: *See*—
Bailey, Alan; and Maggs, Frederick A. P., 4,234,326, Cl. 55-278.000.

Maher, John F., to United Technologies Corporation. Collector for water separator. 4,234,323, Cl. 55-97.000.

Mailloux, Louis D.; and Reilich, William M., to Xerox Corporation. Electrophotographic printing system. 4,234,250, Cl. 355-4.000.

Majima, Junji: *See*—
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Maklakova, Tatyana A.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.

Malavasi, Alberto. Process for the laying of a floor, and for a tile clothing, and elements for the realization thereof. 4,233,792, Cl. 52-387.000.

Malinowski, Richard F.; and Harmon, Thomas F., to General Electric Company. Ornamental attachment for decorative string sets. 4,234,915, Cl. 362-252.000.

Maliszewski, Theodore V., to Combustion Engineering, Inc. Bowl mill with air deflector means. 4,234,132, Cl. 241-53.000.

Mallan, George M.; and Preston, George T., to Occidental Petroleum Corporation. Removal of chlorine from pyrolytic oils. 4,234,388, Cl. 201-25.000.

Mallinson, Leonard B., to Baker Perkins Holdings, Ltd. Drying printed web material. 4,233,901, Cl. 101-416.00A.

Malmros, Mark K.: *See*—
Hevey, Richard C.; Malmros, Mark K.; and Petko, Wayne W., 4,234,680, Cl. 435-7.000.

Mammel, A. Dean: *See*—
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Manchem Limited: *See*—
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Mandi, Attila: *See*—
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Mandrin, Charles, to Sulzer Brothers Limited. Process and apparatus for the preparation of ammonia and heavy water. 4,234,553, Cl. 423-359.000.

Mannesmann Aktiengesellschaft: *See*—
Hendrischk, Wolfgang; Nolte, Gerhard; and Schrader, Gerhard, 4,234,261, Cl. 400-621.000.

Mantani, Rokurota, to Nippon Gakki Seizo Kabushiki Kaisha. Frequency conversion system of tone signal produced by electrically picking up mechanical vibration of musical instrument. 4,233,874, Cl. 84-1.230.

Marathon Oil Company: *See*—
Rhudy, John S.; and Gibb, Connie L., 4,234,433, Cl. 252-8.55D.

Mardesich, Nicholas A.: *See*—
Burger, Norman D., 4,233,725, Cl. 29-451.000.

Margetts, Hugh G.; and Rouse, Keith M., to Girling Limited. Disc brakes for vehicles. 4,234,061, Cl. 188-71.300.

Margolis, Jack S.: *See*—
United States of America, National Aeronautics and Space Administration; Margolis, Jack S.; and Shumate, Michael S., 4,234,258, Cl. 356-437.000.

Maringer, Albert, to Siemens Aktiengesellschaft. Methods of eliminating conversion factor drift effects in a clip-on hall-effect ammeter. 4,234,846, Cl. 324-117.00H.

Marquez, Joseph A.: *See*—
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,234,685, Cl. 435-80.000.
Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., 4,234,690, Cl. 435-119.000.

Marranca, Lucio: *See*—
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Mars, Inc.: *See*—
Heiman, Frederic P., 4,234,070, Cl. 194-1.00N.

Marsh, David G., to Johns Hopkins University, The. Production of aldehyde-treated allergen-containing substances. 4,234,569, Cl. 424-91.000.

Marshall, James J., to Lifeline Products, Inc. Starch-degrading enzymes derived from *cladosporium resinae*. 4,234,686, Cl. 435-94.000.

Martin, Gary G.; and Smith, James C., to Caterpillar Tractor Co. Water seal assembly for engines. 4,234,198, Cl. 277-145.000.

Martin, Paul F.: *See*—
Earing, Mason H.; Gielinski, Leonard H.; Martin, Paul F.; and Petschke, Glenn H., 4,234,714, Cl. 528-67.000.
Martin, Pierre: *See*—
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Martin, Raymond B., to Water Control Products/N.A., Inc. Pressure flush tank for toilets. 4,233,698, Cl. 4-354.000.
Martin, William F., to Herring, James A., a part interest. Apparatus for separating metal cuttings from liquid coolants. 4,234,074, Cl. 198-558.000.
Martinez, Evidio. Roof top carrier. 4,234,285, Cl. 414-462.000.
Maruyama, Masaki; and Nakamura, Kohei, to Hochiki Corporation. Ion type smoke sensor. 4,234,877, Cl. 340-629.000.
Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,234,181, Cl. 273-1.00R.
Marwil, Stanley J.: *See*—
Wu, Yulin; and Marwil, Stanley J., 4,234,752, Cl. 585-640.000.
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Van Nie, Cornelis P.; Werner, Franz; Maryschka, Gerhard; and Sieben, Joannus H. F. C., 4,234,140, Cl. 242-199.000.
Masaki, Kenji. Exhaust gas reaction control system. 4,233,811, Cl. 60-274.000.
Masaoka, Isao; and Imai, Katsuyuki, to Hitachi, Ltd. Method of making a structure immune against stress corrosion cracking. 4,234,119, Cl. 228-125.000.
Mascher, Werner: *See*—
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Maschinenfabrik Andritz Aktiengesellschaft: *See*—
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Massachusetts Institute of Technology: *See*—
Pratt, George W., Jr., 4,233,845, Cl. 73-432.00R.
Master, Raj N.: *See*—
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Matinlassi, Ulf A., to Sandvik Special Metal Corporation. Method and apparatus for producing zircaloy tubes and zircaloy tubes thus produced. 4,233,834, Cl. 72-208.000.
Matoba, Yasuo, to Osaka Soda Co. Ltd. Curable composition of halogen-containing polymer and crosslinking agent therefor. 4,234,705, Cl. 525-329.000.
Matovich, Edwin, to Thagard Technology Company. Fluid-wall reactor for high temperature chemical reaction processes. 4,234,543, Cl. 422-109.000.
Matsubara, Katsumi; Nozawa, Shigekazu; Ishii, Masaharu; and Miyagawa, Mitsuhiko, to Hitachi, Ltd. Screw compressor. 4,234,296, Cl. 418-201.000.
Matsui, Kanenobu: *See*—
Umemura, Sumio; Matsui, Kanenobu; Ikeda, Yoshinari; Masunaga, Katsuro; and Kadota, Takumi, 4,234,740, Cl. 560-81.000.
Matsumoto, Kozo: *See*—
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Matsumoto, Masataka, to Citizen Watch Co., Ltd. Solar battery powered timepiece. 4,234,947, Cl. 368-287.000.
Matsumoto, Seiji: *See*—
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Matsumura, Kazuo: *See*—
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Matsuo, Terumoto: *See*—
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Ota, Mitsuharu; Yoshida, Isao; and Nakano, Hiromitsu, 4,234,835, Cl. 318-317.000.
Suzuki, Yoshiki; Nakakuki, Junichi; Mizukawa, Takumi; and Ogino, Yoshio, 4,234,917, Cl. 363-160.000.
Matthews, Lloyd E., to Zenith Radio Corporation. Self-oscillating sawtooth current deflection generator. 4,234,828, Cl. 315-408.000.
Mattson, Larry J., to Howmedica, Inc. Closure means for collection appliances. 4,233,977, Cl. 128-283.000.
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Maurer, Fritz; Schroder, Rolf; Hammann, Ingeborg; Homeyer, Bernhard; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Combating pests with N,N-dimethyl-carbamic acid O-(2-substituted-methyl-pyrimidin-4-yl)-esters. 4,234,587, Cl. 424-251.000.
Mawson, Alan: *See*—
Brewer, Douglas M.; Mawson, Alan; and Carter, William S., 4,234,366, Cl. 156-79.000.
Max-Planck-Gesellschaft zur forderung der Wissenschaften e.V.: *See*—
Rabenau, Albrecht; von Alpen, Ulrich; Schonherr, Erich; and Muller, Gertraude, 4,234,554, Cl. 423-409.000.
Maxey, Eugene R., to Purex Corporation. Underwater light circuit and installation. 4,234,819, Cl. 315-119.000.
Mayer, Ben, to Envel Corporation. Adjustable connecting means for ceiling constructions and the like. 4,233,794, Cl. 52-484.000.
Mazzoni, Renato J.; and Shoop, Vernon A., to PPG Industries, Inc. Desiccated spandrel panels. 4,233,796, Cl. 52-789.000.
MCA Discovision, Inc.: *See*—
Winslow, John S., 4,234,837, Cl. 318-577.000.
McAleer, William J.; Miller, William J.; and Wasmuth, Edward H., to Merck & Co., Inc. Hepatitis B core antigen composition. 4,234,564, Cl. 424-12.000.
McCallum, Dale A.: *See*—
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McCallum, Gerald; and McCallum, Dale A. Fireplace and room heater. 4,233,955, Cl. 126-61.000.
McCarthy, Gregory M. Resting place for reptiles in captivity. 4,234,780, Cl. 219-200.000.
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McCord Corporation: *See*—
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McCorkle, John W. Coherent frequency shift key demodulator. 4,234,852, Cl. 329-50.000.
McDermott, Clifton E. Fastening means for flexible material. 4,233,715, Cl. 24-217.00R.
McDonald, Ray S.: *See*—
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McDonnell Douglas Corporation: *See*—
Higginbotham, John W.; and Dowden, Dennis L., 4,234,253, Cl. 356-73.100.
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McDonough, John C.; Rary, James K.; Birth, Arden; and Kuzma, John J., Jr., to Bandag, Incorporated. Method for recapping tires. 4,234,370, Cl. 156-95.000.
McDougal, Thomas F. Differential screw device for workholders and the like. 4,234,177, Cl. 269-241.000.
McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., to Lord Corporation. Radiation curable compositions containing acyloin urethane compounds. 4,234,399, Cl. 204-159.150.
McGahren, William J.: *See*—
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McGauran, Hugh K.; and Saunders, Leonard, to Aerpat A.G. Barb and method of making same. 4,233,878, Cl. 85-7.000.
McGee, Mary Ann C., to Caterpillar Tractor Co. Storable light assembly for vehicles. 4,234,908, Cl. 362-66.000.
McGraw-Edison Company: *See*—
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McIndoe, Christopher J., to Imperial Chemical Industries Limited. Process for the manufacture of butenediol. 4,234,747, Cl. 568-857.000.
McKenna, Lawrence W., Jr.; Finkelstein, Ronald S.; and Haynes, John K., Jr., to Monsanto Company. Pressure sensitive adhesive compositions containing a polymetaloxane and article. 4,234,660, Cl. 428-411.000.
McMillan, William A. Beta-lactamase diagnostic product and method. 4,234,683, Cl. 435-18.000.
McMullen, Alan R., to NESCO Products, Inc. Steam iron with low temperature soleplate. 4,233,763, Cl. 38-77.830.
McNally, Thomas E.; Holka, Thomas C.; and Moreau, Harold T., to Ford Motor Company. Passive restraint actuator mechanism system. 4,234,210, Cl. 280-804.000.
McNary, James F.: *See*—
Person, Abraham; Wetmore, Sherman B.; and McNary, James F., 4,234,269, Cl. 405-195.000.
McNeilab, Inc.: *See*—
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McPheeters, Charles C.: *See*—
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McRae, Lorin P.; and Kartchner, Mark M., to Narco Scientific Industries, Inc. Hemostatic compressive device. 4,233,980, Cl. 128-325.000.

Mead Corporation, The: *See*—
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Mead Johnson & Company: *See*—
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Temple, Davis L., Jr., 4,234,581, Cl. 424-248.510.

Meadows, David F., to DoNel Corporation. Extrusions and building structures. 4,233,790, Cl. 52-222.000.

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Medtronic Inc.: *See*—
Hartlaub, Jerome T.; McDonald, Ray S.; and Shearon, Lawrence W., 4,233,985, Cl. 128-419.0PG.

Mee, Francis H. A.; and Taylor, Henry J., to Spar Aerospace Limited. Mechanical arm assembly. 4,234,150, Cl. 248-281.100.

Meier, George D., Jr., to Electrode Dressers Incorporated. Dresser for offset electrode. 4,234,276, Cl. 408-104.000.

Meinan Machinery Works, Inc.: *See*—
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Meinders, Horst, to Robert Bosch GmbH. Method for manufacturing a semiconductor element utilizing thermal neutron irradiation and annealing. 4,234,355, Cl. 148-1.500.

Meinhardt, Norman A.; and Davis, Kirk E., to Lubrizol Corporation, The. Novel carboxylic acid acylating agents, derivatives thereof, concentrate and lubricant compositions containing the same, and processes for their preparation. 4,234,435, Cl. 252-51.50A.

Melchior, Jean F., to Etat Francais. Methods of supercharging a diesel engine, in supercharged diesel engines, and in supercharging units for diesel engines. 4,233,815, Cl. 60-606.000.

Melnyk, William, to McCord Corporation. Radiator tank headsheet and method. 4,234,041, Cl. 165-173.000.

Mennicke, Winfried; Scholl, Walter; and Schundehutte, Karl-Heinz, to Bayer Aktiengesellschaft. Chromium mixed complex dyestuffs of phenyl-azo-pyrazole components. 4,234,479, Cl. 260-145.00B.

Mercier, Jacques H., to Normand Trust. Accumulator device or the like. 4,234,017, Cl. 138-30.000.

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Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., 4,234,596, Cl. 424-274.000.
McAleer, William J.; Miller, William J.; and Wasmuth, Edward H., 4,234,564, Cl. 424-12.000.

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Metz, Robert L.: *See*—
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Petersen, Uwe; Voss, Eckart; Metzger, Karl G.; and Stadler, Peter, 4,234,572, Cl. 424-180.000.

Meyer, John H.: *See*—
Gray, Dorian R.; Guerra, Salvatore; and Meyer, John H., 4,234,331, Cl. 65-60.00R.

Meyer, Rolf; and Schonmeier, Herbert, to Jagenberg-Werke Aktiengesellschaft. Apparatus for slitting webs of material. 4,233,869, Cl. 83-500.000.

Meyercord Co., The: *See*—
Grotefend, Alan C.; and Thon, Stephen F., 4,234,643, Cl. 428-200.000.

Meyers, John D.: *See*—
Prause, Benjamin G.; and Meyers, John D., 4,234,942, Cl. 367-128.000.

Miano, Ralph R.; and Keith, Charles H., to Celanese Corporation. Smoking material. 4,233,993, Cl. 131-2.000.

Michaud, Horst; Rieder, Georg; and Seeholzer, Josef, to SKW Trostberg Aktiengesellschaft. Aqueous fertilizer solutions containing dicyandiamide. 4,234,332, Cl. 71-30.000.

Micro-Mega S.A.: *See*—
Leonard, Henri, 4,234,308, Cl. 433-127.000.

Midgett, Preston C.: *See*—
Rogers, Walter E.; and Midgett, Preston C., 4,234,037, Cl. 165-3.000.

Midorikawa, Yuichiro: *See*—
Kusakabe, Hitoshi; Kodama, Kenjiro; Midorikawa, Yuichiro; Kuninaka, Akira; Misono, Haruo; and Soda, Kenji, 4,234,691, Cl. 435-191.000.

Midrex Corporation: *See*—
Scarlett, John C.; and Beggs, Donald, 4,234,169, Cl. 266-156.000.

Miko, Richard J., to Edo Corporation. Automatically self-adjusting and load-limiting swaybrace system. 4,233,883, Cl. 89-1.50B.

Mikulicz, Michael Z., to UOP Inc. HF Alkylation process. 4,234,750, Cl. 585-332.000.

Miles Laboratories, Inc.: *See*—
Toth, Steven J., 4,233,817, Cl. 62-175.000.

Millard, Gregory S. T.: *See*—
Argyle, Charles S.; Bamsey, Robert G.; and Millard, Gregory S. T., 4,234,040, Cl. 165-164.000.

Miller, Charles G.; and Stephens, James B., to Yamaha Motor Corporation, U.S.A. Fuel tank fill port extension. 4,234,098, Cl. 220-86.00R.

Miller, Gene C.: *See*—
Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., 4,234,281, Cl. 414-37.000.

Miller, Jerry W., to Ampex Corporation. DC Free encoding for data transmission. 4,234,897, Cl. 360-45.000.

Miller, Walter E., Jr.; Duke, Jimmy R.; Starkey, George W.; and Sitton, Robert L., to United States of America, Army. Range gated retroreflective missile guidance system. 4,234,141, Cl. 244-3.130.

Miller, William J.: *See*—
McAleer, William J.; Miller, William J.; and Wasmuth, Edward H., 4,234,564, Cl. 424-12.000.

Millsap, Roy V.: *See*—
Pipes, William F.; Millsap, Roy V.; McClure, Richard W.; and Hooper, Harrison G., 4,234,958, Cl. 375-107.000.

Milnes, Frank J.: *See*—
Scott, Robert N.; Gavin, David F.; and Milnes, Frank J., 4,234,441, Cl. 252-78.300.

Milutziki, Udo: *See*—
Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, 4,234,836, Cl. 318-480.000.

Minnesota Mining and Manufacturing Company: *See*—
Dunshee, Wayne K., 4,233,976, Cl. 128-260.000.
Graham, Joseph, 4,234,639, Cl. 428-144.000.
Henschel, John P., 4,234,967, Cl. 455-603.000.
Kehr, Dieter; and Goebell, Juergen, 4,234,439, Cl. 252-63.200.

Minolta Camera Kabushiki Kaisha: *See*—
Tokumaru, Hisashi; and Yasukuni, Mitsuo, 4,234,894, Cl. 358-250.000.

Minoshima, Tsugio: *See*—
Sakamoto, Suguru; Nakazato, Takuzo; Minoshima, Tsugio; and Tanaka, Tohachiro, 4,234,217, Cl. 285-150.000.

Minoura, Mikio: *See*—
Yorioka, Keigo; and Minoura, Mikio, 4,233,946, Cl. 123-568.000.

Mishanec, Stephen P.: *See*—
Brown, Joe B.; Thompson, Louis I.; and Mishanec, Stephen P., 4,233,907, Cl. 104-172.00B.

Mishiro, Mashahiro; Nishikawa, Tokio; Ohashi, Shigeyasu; and Yokokawa, Yasuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Membrane filtration type hollow fibers and method for the preparation of same. 4,234,431, Cl. 210-500.00M.

Misono, Haruo: *See*—
Kusakabe, Hitoshi; Kodama, Kenjiro; Midorikawa, Yuichiro; Kuninaka, Akira; Misono, Haruo; and Soda, Kenji, 4,234,691, Cl. 435-191.000.

Mitchell, Stephen C.: *See*—
Lower, William E.; Mitchell, Stephen C.; and Simpson, Jeremy F., 4,234,416, Cl. 209-247.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujiwara, Yukio; Yamaji, Shigeru; Shibuya, Yoshikazu; and Nitta, Tohei, 4,234,902, Cl. 361-120.000.
Miyazaki, Yukio; and Taketa, Mitsugu, 4,234,900, Cl. 361-45.000.
Onishi, Ken; and Tanaka, Kunimaro, 4,234,896, Cl. 360-32.000.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; and Miyauchi, Yuh, 4,234,733, Cl. 546-174.000.

Mitzlaff, Michael; and Warning, Klaus, to Hoechst Aktiengesellschaft. Process for the preparation of cyclic enamides. 4,234,484, Cl. 260-239.0BE.

Miyagawa, Mitsuhiko: *See*—
Matsubara, Katsumi; Nozawa, Shigekazu; Ishii, Masaharu; and Miyagawa, Mitsuhiko, 4,234,296, Cl. 418-201.000.

Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, to Canon Kabushiki Kaisha. Transfer sheet guiding device. 4,234,305, Cl. 432-59.000.

Miyauchi, Yuh: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; and Miyauchi, Yuh, 4,234,733, Cl. 546-174.000.

Miyazaki, Yukio; and Taketa, Mitsugu, to Mitsubishi Denki Kabushiki Kaisha. Ground fault detector. 4,234,900, Cl. 361-45.000.

Mizukawa, Takumi: *See*—
Suzuki, Yoshiaki; Nakakuki, Junichi; Mizukawa, Takumi; and Ogino, Yoshio, 4,234,917, Cl. 363-160.000.

Mizutani, Nagao: *See*—
Kunita, Masao; Mizutani, Nagao; and Kurihara, Toshio, 4,234,260, Cl. 400-219.300.

Mobay Chemical Corporation: *See*—
Phillips, Barry A.; Spitler, Keith G.; and Keegan, Richard E., 4,234,745, Cl. 568-614.000.

Moberly, Charles W.; Welch, Melvin B.; and Fodor, Lawrence M., to Phillips Petroleum Company. Catalyst and a polymerization process employing the catalyst. 4,234,710, Cl. 526-125.000.

Mobil Oil Corporation: *See*—
Allen, Kenneth P.; and Redeker, Maynard S., 4,234,938, Cl. 367-24.000.
Herrington, F. John, Jr., 4,234,018, Cl. 138-45.000.
Yan, Tsoung-Yuan, 4,234,231, Cl. 299-4.000.
Young, Lewis B., 4,234,751, Cl. 585-486.000.

Mochizuki, Hidetoshi; and Okada, Masataka, to Clarion Co., Ltd. AGC Circuit responsive to intermediate gray level in video signal. 4,234,892, Cl. 358-174.000.

Moga, Nicholas: *See—*
Hartley, Frederick; Slocum, Keith; Newquist, John; and Moga, Nicholas, 4,233,902, Cl. 102-41.000.

Moller, Friedrich W.: *See—*
Jockel, Heinz; Moller, Friedrich W.; Renner, Hans J.; and Krumm, Hagen, 4,234,451, Cl. 252-373.000.

Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Jr., 4,233,896, Cl. 101-110.000.

Moncaster, Michael B.; and Rummer, James D., to Vickers Limited. Sealing arrangements. 4,234,199, Cl. 277-237.00R.

Moncur, Marlowe V.: *See—*
Woodbrey, James C.; and Moncur, Marlowe V., 4,234,674, Cl. 430-253.000.

Monsanto Company: *See—*
Birum, Gail H.; and Jansen, Richard F., 4,234,696, Cl. 521-108.000.
McKenna, Lawrence W., Jr.; Finkelstein, Ronald S.; and Haynes, John K., Jr., 4,234,660, Cl. 428-411.000.
Woodbrey, James C.; and Moncur, Marlowe V., 4,234,674, Cl. 430-253.000.

Montell, Joseph J., to Rug Crafters. Method of making a rug. 4,233,918, Cl. 112-266.200.

Montgomery, Edward L.: *See—*
Van Nieuwal, John G.; Montgomery, Edward L.; and Beeghly, Richard M., 4,234,030, Cl. 152-354.00R.

Mookherjee, Braja D.: *See—*
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,234,616, Cl. 426-536.000.

Moore, Albert S.; and Verhoff, Francis H., to United States of America, Energy. Energy recovery system. 4,234,423, Cl. 210-758.000.

Moore, William T.; and Sweeney, Michael T., to Rank Organization Limited, The. Optical scanning system with unwanted reflections controlled. 4,234,240, Cl. 350-6.100.

Moran, James: *See—*
Conway, Bernard W.; Fegley, Nelson L.; and Moran, James, 4,234,379, Cl. 162-145.000.

Moreau, Harold T.: *See—*
McNally, Thomas E.; Holka, Thomas C.; and Moreau, Harold T., 4,234,210, Cl. 280-804.000.

Morefield, Joe. Hair treatment device. 4,234,001, Cl. 132-40.000.

Morgan, Chester S.; and Johnson, William R., to United States of America, Energy. Thermal shock resistance ceramic insulator. 4,234,338, Cl. 75-235.000.

Morgan, Norman D., to Rain Bird Sprinkler Mfg. Corp. Balanced, reaction impact sprinkler. 4,234,126, Cl. 239-230.000.

Morgon, Trevor A.: *See—*
Beasley, Robin D.; Hall, Trevor I.; and Morgon, Trevor A., 4,234,970, Cl. 455-607.000.

Morimura Shoji Kabushiki Kaisha: *See—*
Murai, Hiroshi, 4,234,876, Cl. 340-573.000.

Morinaga, Shigeki: *See—*
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Morokawa, Shigeru: *See—*
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Morris, James C.: *See—*
Garrison, Robert L.; and Morris, James C., 4,234,822, Cl. 315-209.00R.

Morris, Royden B. Microfiche tray. 4,234,089, Cl. 206-456.000.

Morris, Solon S., Jr. Driver alertness device. 4,234,051, Cl. 180-272.000.

Morrison, James D.: *See—*
Enke, Christie G.; Yost, Richard A.; and Morrison, James D., 4,234,791, Cl. 250-281.000.

Morrison, John C.: *See—*
Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., 4,234,476, Cl. 260-112.00R.

Morrison, Robert B.: *See—*
Adams, Michael B.; Angold, John A.; Morrison, Robert B.; and Zimmerman, Robert E., 4,233,909, Cl. 105-4.00R.

Morrison, William C.: *See—*
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Morshauser, Fred S., to GAF Corporation. Detergent bar composition and binder therefor. 4,234,464, Cl. 252-544.000.

Moser, Paul: *See—*
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,234,723, Cl. 544-64.000.

Moser, Vincent J.: *See—*
Emmons, William D.; and Moser, Vincent J., 4,234,711, Cl. 526-282.000.

Moshtev, Rafail V.; Budevska, Hrisanta N.; Ivanova, Latinka T.; and Yankova, Radka D., to ZLEHIT pri BAN. Method for the production of membrane battery separators. 4,234,623, Cl. 427-54.100.

Mosley, William H.; and Andren, Carl F., to E-Systems, Inc. Double balanced diode mixer with d.c. response. 4,234,966, Cl. 455-326.000.

Mossinger, Reinhard: *See—*
Wenzel, Hubert; and Mossinger, Reinhard, 4,234,136, Cl. 242-68.400.

Motegi, Masahiko; Kimata, Ikukazu; and Fujita, Saburo, to Toray Industries, Inc. Method of manufacturing polyester films. 4,234,532, Cl. 264-235.800.

Motorola, Inc.: *See—*
Andrea, Ralph W., III; Bennett, Leonard W.; and O'Connor, William W., 4,234,959, Cl. 455-35.000.
Bickley, Robert H.; Briggs, Ronald C.; and Jost, Ronald C., 4,234,965, Cl. 455-285.000.
La Vance, Cecil N.; and Beale, Allan A., 4,234,924, Cl. 364-460.000.
Stauers, Juris, 4,234,881, Cl. 343-8.000.

Mott, George E., to Texaco Inc. Disconnectable riser for deep water operation. 4,234,047, Cl. 175-5.000.

Moulies, Jean-Claude: *See—*
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Mower, Lawrence N.: *See—*
Kirkpatrick, John W.; and Mower, Lawrence N., 4,234,042, Cl. 166-261.000.

Moxham, Jack H.: *See—*
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Mrowca, Joseph J., to Du Pont de Nemours, E. I., and Company. Phosphine oxide-substituted pyrimidines. 4,234,729, Cl. 544-243.000.

Muller, Adolf: *See—*
Quester, Karl W.; Gontgen, Josef; and Muller, Adolf, 4,233,997, Cl. 131-147.00R.

Muller, Beat; Schneider, Peter; Peter, Heinrich; and Bickel, Hans, to Ciba-Geigy Corporation. Aminoethyl-methoxy-cephalosporin compounds. 4,234,578, Cl. 424-246.000.

Muller, Dieter: *See—*
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Muller, Gertraude: *See—*
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Muller, Helmut: *See—*
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,234,723, Cl. 544-64.000.

Muller, Jurgen, to Agfa-Gevaert AG. Apparatus for loading and unloading containers for X-ray film. 4,234,795, Cl. 250-468.000.

Muller, Otto: *See—*
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Multi-Metal Wire Cloth Inc.: *See—*
Peer, George J.; and Bradley, Robert C., 4,234,430, Cl. 210-489.000.

Munn, David E.: *See—*
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Murai, Hiroshi, to Riken-Denshi Kogyo Kabushiki Kaisha; and Morimura Shoji Kabushiki Kaisha. Omnidirectional move-stop sensor. 4,234,876, Cl. 340-573.000.

Murakami, Hiroshi: *See—*
Noda, Kenichi; Murakami, Hiroshi; and Kurata, Noboru, 4,233,717, Cl. 29-156.4WL.

Murakami, Yasushi: *See—*
Takahashi, Hironobu; Honda, Masamitus; Murakami, Yasushi; and Iwane, Yoshitaka, 4,234,582, Cl. 424-249.000.

Murphy, Robert E.; and Bernholdt, Harry F., to Swift & Company. Meat packaging of foam and oxygen impervious material. 4,234,647, Cl. 428-220.000.

Murray, Omer E.; and Thompson, Richard L., to General Electric Company. Luminaire lowering device. 4,234,165, Cl. 248-404.000.

Myers, Daniel J. Adjustable carrier. 4,234,116, Cl. 224-250.000.

Nagasawa, Osamu: *See—*
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Nagel, Otto: *See—*
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Nagy, Gabor: *See—*
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Nairn Floors Limited: *See—*
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Nakagawa, Akira: *See—*
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Nakagawa, Satoshi: *See—*
Yoshimoto, Shinji; Fujiwhara, Mitsuto; Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Nakagawa, Satoshi, 4,234,678, Cl. 430-564.000.

Nakagawa, Shozo; Yokoyama, Katsuya; and Katayama, Hironobu, to Nippon Hoso Kyokai. Digital magnetic recording and reproducing apparatus. 4,234,898, Cl. 360-41.000.

Nakagawa, Tohru: *See—*
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Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, to Brother Kogyo Kabushiki Kaisha. Single element print head. 4,234,262, Cl. 400-175.000.

Nakakuki, Junichi: *See—*
Suzuki, Yoshiaki; Nakakuki, Junichi; Mizukawa, Takumi; and Ogino, Yoshio, 4,234,917, Cl. 363-160.000.

Nakamoto, Hiromasa: *See—*
Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, 4,234,720, Cl. 542-413.000.

Nakamura, Akito, to Toray Silicone Company, Ltd. Silicone rubber compositions. 4,234,702, Cl. 525-100.000.

Nakamura, Kazuo: *See—*
Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, 4,234,262, Cl. 400-175.000.
Nakamura, Kohei: *See—*
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Nakamura, Masayoshi: *See—*
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Nakamura, Soichi, to Nippon Kogaku K.K. Gauss type photographic lens. 4,234,242, Cl. 350-218.000.
Nakamura, Tsutomu: *See—*
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.
Nakanaga, Ryusuke: *See—*
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Nakane, Masao; and Nishii, Masahiko, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Lift truck having a load lifting assembly. 4,234,057, Cl. 187-9.00E.
Nakano, Hiromitsu: *See—*
Ota, Mitsuharu; Yoshida, Isao; and Nakano, Hiromitsu, 4,234,835, Cl. 318-317.000.
Nakata, Tadataka: *See—*
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Nakatani, Kiyotaka; and Konno, Kunikazu, to Hosiden Electronics Co., Ltd. Display device for a push button assembly. 4,234,773, Cl. 200-308.000.
Nakayama, Toshihiko: *See—*
Hishida, Hiroshi; Nakayama, Toshihiko; Koyama, Isao; and Wakabayashi, Hisao, 4,234,811, Cl. 310-348.000.
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Sakamoto, Suguru; Nakazato, Takuzo; Minoshima, Tsugio; and Tanaka, Tohachiro, 4,234,217, Cl. 285-150.000.
Nalvarian, Francois J. Manual ski carrier. 4,234,113, Cl. 224-45.00S.
Nandi, Biswa N.; Belinko, Keith; Ciavaglia, Lynn A.; Pruden, Barry B.; and Denis, Jean-Marie D., to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources. Coking poor coking coals and hydrocracked tar sand bitumen binder. 4,234,387, Cl. 201-23.000.
Narcise, Jacqualine. Mathematics device. 4,233,757, Cl. 35-73.000.
Narco Scientific Industries, Inc.: *See—*
McRae, Lorin P.; and Kartchner, Mark M., 4,233,980, Cl. 128-325.000.
Narui, Mamoru: *See—*
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Naser, Georg, to Siemens Aktiengesellschaft. Method of screwing an adapter into the human cranium. 4,233,979, Cl. 128-303.00R.
National Computer Sign Company: *See—*
Charlot, Lincoln H., 4,234,823, Cl. 315-224.000.
National Distillers and Chemical Corp.: *See—*
Frampton, Orville D.; and Birchall, William R., 4,234,748, Cl. 568-901.000.
National Petro Chemicals Corporation: *See—*
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,234,453, Cl. 252-428.000.
Rekers, Louis J.; and Katzen, Stanley J., 4,234,709, Cl. 526-100.000.
National Starch and Chemical Corporation: *See—*
Pastor, Stephen D.; and Ganslaw, Stuart H., 4,234,662, Cl. 428-500.000.
National Steel Corporation: *See—*
Bird, Richard A.; and Austin, Lowell W., 4,234,406, Cl. 204-292.000.
Suitlas, John R., 4,234,170, Cl. 266-158.000.
NCR Corporation: *See—*
Singh, Amar J., 4,234,968, Cl. 455-607.000.
Singh, Amar J., 4,234,969, Cl. 455-607.000.
Neal, Gaines L.: *See—*
Crumrine, David F., 4,233,948, Cl. 123-590.000.
Near Field Technology Co.: *See—*
Yukl, Tex N., 4,234,844, Cl. 324-58.50A.
Nederman, Bill P. P. Track forming a gas-throughflow duct and provided with a movable gas passage unit. 4,233,889, Cl. 98-115.0VM.
Nelson, Stephen J., to Upjohn Company, The. Phosphorus derivatives of aminothiocarbamoyl halides. 4,234,521, Cl. 260-937.000.
Neny, Michel, to Societe d'Investissement pour le Developpement des Appareils Menagers. Panels for collecting solar energy. 4,233,962, Cl. 126-450.000.
NESCO Products, Inc.: *See—*
McMullen, Alan R., 4,233,763, Cl. 38-77.830.
Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., to Syntex (U.S.A.) Inc. Nonapeptide and decapeptide derivatives of luteinizing hormone releasing hormone. 4,234,571, Cl. 424-177.000.
Neufeld, Anthony C., to Newfeld Limited. Soft toys. 4,233,775, Cl. 46-151.000.
Neugart, Fernando M. Combustion apparatus. 4,234,303, Cl. 431-293.000.
Newfeld Limited: *See—*
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Newman, Albert F.: *See—*
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Newquist, John: *See—*
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Nicholls, Ronald T.: *See—*
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Nielsen, Harrie W.: *See—*
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Nifco Inc.: *See—*
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Nikles, Erwin: *See—*
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Nippon Carbon Co., Ltd.: *See—*
Yamazoe, Hiroshi; and Sugiura, Isao, 4,234,638, Cl. 428-133.000.
Nippon Engelhard Ltd.: *See—*
Kamiya, Kunio; Yusa, Hideo; Kitamura, Masao; Takeshima, Masaki; and Ishidate, Toshio, 4,234,456, Cl. 252-438.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Adachi, Takeshi; Koike, Masahiko; and Takahashi, Toshiyuki, 4,233,875, Cl. 84-1.240.
Mantani, Rokurota, 4,233,874, Cl. 84-1.230.
Nonaka, Terumoto, 4,234,803, Cl. 307-218.000.
Nippon Hoso Kyokai: *See—*
Nakagawa, Shozo; Yokoyama, Katsuya; and Katayama, Hironobu, 4,234,898, Cl. 360-41.000.
Nippon Kogaku K.K.: *See—*
Nakamura, Soichi, 4,234,242, Cl. 350-218.000.
Nippon Kokan Kabushiki Kaisha: *See—*
Hara, Keiichi; and Fujisawa, Tomoji, 4,233,928, Cl. 118-35.000.
Nippon Oil Seal Industry Co., Ltd.: *See—*
Iida, Yoshimi, 4,234,196, Cl. 277-12.000.
Nippon Paint Co., Ltd.: *See—*
Takahashi, Mitsuru; Omori, Yukio; Ikeda, Shuji; and Kataoka, Hiroyoshi, 4,234,466, Cl. 260-17.00A.
Nippon Soken, Inc.: *See—*
Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, 4,233,944, Cl. 123-416.000.
Nippon Steel Corporation: *See—*
Horiguchi, Hiroshi; and Matsuo, Terumoto, 4,233,718, Cl. 29-157.00C.
Nippondenso Co., Ltd.: *See—*
Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, 4,233,944, Cl. 123-416.000.
Nishida, Fumihiko; and Ijiri, Hiroshi, to Dainippon Screen Seizo Kabushiki Kaisha. Automatic picture masking device. 4,234,251, Cl. 355-74.000.
Nishihara, Motohisa: *See—*
Sato, Hideo; Kawakami, Kanji; and Nishihara, Motohisa, 4,233,848, Cl. 73-727.000.
Nishii, Masahiko: *See—*
Nakane, Masao; and Nishii, Masahiko, 4,234,057, Cl. 187-9.00E.
Nishikawa, Tokio: *See—*
Mishiro, Mashahiro; Nishikawa, Tokio; Ohashi, Shigeyasu; and Yokokawa, Yasuo, 4,234,431, Cl. 210-500.00M.
Nishimura, Yasushi; Uehara, Yasuo; and Haga, Tamio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Adsorbent for ethylene and process for preparation thereof. 4,234,460, Cl. 252-447.000.
Nissan Motor Company, Limited: *See—*
Abo, Toshimi, 4,233,947, Cl. 123-571.000.
Oikawa, Akio; and Sasai, Koji, 4,233,927, Cl. 116-287.000.
Yoneda, Kenji; and Takagi, Yasuo, 4,233,836, Cl. 73-35.000.
Nissan Shatai Co., Ltd.: *See—*
Kuroda, Masahiko; and Ohsawa, Eiji, 4,234,866, Cl. 340-52.00F.
Nitta, Minoru: *See—*
Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, 4,234,168, Cl. 266-128.000.
Nitta, Tohei: *See—*
Fujiwara, Yukio; Yamaji, Shigeru; Shibuya, Yoshikazu; and Nitta, Tohei, 4,234,902, Cl. 361-120.000.
Nitto Boseki Co., Ltd.: *See—*
Wakasa, Isao; Yamazaki, Shuichi; and Taguchi, Hideo, 4,234,342, Cl. 106-50.000.
Noda, Kenichi; Murakami, Hiroshi; and Kurata, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Method of bevelling port openings in cylinders for two-cycle engines. 4,233,717, Cl. 29-156.4WL.
Nogimori, Katsumi: *See—*
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.

Noguchi, Toyota: *See*—
Ikushima, Hiroshi; Noguchi, Toyota; Danno, Tsuneo; and Tamura, Tooru, 4,234,859, Cl. 333-151.000.
Nokes, Richard H.: *See*—
Robinson, Ward T.; and Nokes, Richard H., 4,234,263, Cl. 403-405.000.
Nolen, David W.: *See*—
Dreinhoefer, Louis H.; Nolen, David W.; and Donatelli, Paul C., 4,234,832, Cl. 318-146.000.
Nolte, Gerhard: *See*—
Hendrischk, Wolfgang; Nolte, Gerhard; and Schrader, Gerhard, 4,234,261, Cl. 400-621.000.
Nomura, Yasushi; Komatsu, Yuzo; and Morokawa, Shigeru, to Citizen Watch Co., Ltd.; and Rhythm Watch Co., Ltd. Electronic timepiece with hourly strike mechanism. 4,234,945, Cl. 368-75.000.
Nonaka, Terumoto, to Nippon Gakki Seizo Kabushiki Kaisha. Integrated logic circuit arrangement. 4,234,803, Cl. 307-218.000.
Nordeen, Carl W.: *See*—
Winn, Martin; Nordeen, Carl W.; and Arendsen, David L., 4,234,594, Cl. 424-273.00P.
Normand Trust: *See*—
Mercier, Jacques H., 4,234,017, Cl. 138-30.000.
Northrop Corporation: *See*—
Leiboff, Teague N., 4,234,145, Cl. 244-3.160.
Nott, Frank J. Conveyor belt drive apparatus. 4,234,078, Cl. 198-833.000.
Nova Associates, Inc.: *See*—
Ryding, Geoffrey, 4,234,797, Cl. 250-492.00B.
NOVI P.B. Societe Anonyme: *See*—
Benezech, Jacques, 4,234,905, Cl. 361-307.000.
Novokshonova, Ljudmila A.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.
Nox Research Corp.: *See*—
Burnell, Laurence K.; Hyde, James D.; Kolak, Nicholas P.; and Gibbs, Richard E., 4,234,548, Cl. 423-235.000.
Nozawa, Shigekazu: *See*—
Matsubara, Katsumi; Nozawa, Shigekazu; Ishii, Masaharu; and Miyagawa, Mitsuhiko, 4,234,296, Cl. 418-201.000.
NSK-Warner K.K.: *See*—
Ikesue, Haruyuki, 4,234,209, Cl. 280-803.000.
Nugarus, Anthony R.: *See*—
Schindler, James; and Nugarus, Anthony R., 4,233,891, Cl. 99-348.000.
Nussbaumer, Dietmar; and Perl, Horst, to Sartorius GmbH. Asymmetrical ultrafiltration membrane based on cellulose hydrate. 4,234,528, Cl. 264-41.000.
Oberle, R. Donald: *See*—
Duncan, Dennis A.; Beeson, Justin L.; Oberle, R. Donald; and Dirksen, Henry A., 4,234,407, Cl. 208-8.00R.
Oberrecht, David A.: *See*—
Wilder, Paul R.; and Oberrecht, David A., 4,234,161, Cl. 251-149.900.
O'Brien, Edward F.: *See*—
Hirozawa, Stanley T.; O'Brien, Edward F.; and Wilson, Joe C., 4,234,440, Cl. 252-76.000.
O'Brien, Linda F.: *See*—
Cooper, William C.; and Garcia, Alberto A., 4,233,863, Cl. 81-3.00R.
Obst, Rudiger: *See*—
Wilmes, Manfred; Obst, Rudiger; and Kretzschmar, Wolfgang, 4,234,239, Cl. 339-198.0GA.
Occidental Petroleum Corporation: *See*—
Mallan, George M.; and Preston, George T., 4,234,388, Cl. 201-25.000.
Ochi, Yoshiharu: *See*—
Ozaki, Satoru; Ochi, Yoshiharu; and Matsumura, Kazuo, 4,234,385, Cl. 176-68.000.
O'Connor, William W.: *See*—
Andrea, Ralph W., III; Bennett, Leonard W.; and O'Connor, William W., 4,234,959, Cl. 455-35.000.
Odeen, Kai: *See*—
Kihlstedt, Per G.; Hassler, Hedvig E. B.; and Odeen, Kai, 4,234,380, Cl. 162-152.000.
Oehler Whylen Lagertechnik AG: *See*—
Schaad, Willi, 4,234,059, Cl. 188-43.000.
Oettel, Richard E.: *See*—
Deminet, Czeslaw; and Oettel, Richard E., 4,234,351, Cl. 136-89.0EP.
Ogata, Yasuhiro: *See*—
Kato, Hajime; and Ogata, Yasuhiro, 4,234,212, Cl. 282-27.500.
Ogawa, Hiroshi: *See*—
Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, 4,234,305, Cl. 432-59.000.
Ogden, Dennis H.: *See*—
Inverarity, George; and Ogden, Dennis H., 4,234,698, Cl. 521-188.000.
Ogino, Yoshio: *See*—
Suzuki, Yoshiaki; Nakakuki, Junichi; Mizukawa, Takumi; and Ogino, Yoshio, 4,234,917, Cl. 363-160.000.
Oguchi, Toshihiko: *See*—
Uehara, Tsutomu; Oguchi, Toshihiko; Kubo, Tsutomu; and Suzuki, Yukio, 4,233,935, Cl. 118-657.000.
Ohashi, Shigeyasu: *See*—
Mishiro, Mashahiro; Nishikawa, Tokio; Ohashi, Shigeyasu; and Yokokawa, Yasuo, 4,234,431, Cl. 210-500.00M.
Ohigashi, Hiroji: *See*—
Iguchi, Heishaburo; and Ohigashi, Hiroji, 4,234,813, Cl. 310-366.000.
Ohkawa, Mikio; and Kawashima, Nobuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Vacuum switch. 4,234,771, Cl. 200-144.00B.
Ohsawa, Eiji: *See*—
Kuroda, Masahiko; and Ohsawa, Eiji, 4,234,866, Cl. 340-52.00F.
Ohta, Shigenori; and Watanabe, Kenji, to Kyowa Hakko Kogyo Kabushiki Kaisha. Process for producing cured meat products. 4,234,607, Cl. 426-56.000.
Ohta, Yuzo; Sugi, Norio; Isogai, Osamu; Hirai, Takahiro; and Kaji, Hidehiko, to Idemitsu Kosan Company Limited. Flame retarding polyolefin resin blend composition. 4,234,469, Cl. 260-42.460.
Ohuchida, Shuichi: *See*—
Hayashi, Masaki; Ohuchida, Shuichi; and Arai, Yoshinobu, 4,234,597, Cl. 424-274.000.
Oikawa, Akio; and Sasai, Koji, to Nissan Motor Company, Limited. Instrument assembly with illuminated meter mounting panel. 4,233,927, Cl. 116-287.000.
Okada, Masataka: *See*—
Mochizuki, Hidetoshi; and Okada, Masataka, 4,234,892, Cl. 358-174.000.
Okami, Alvin S. Wind shield. 4,233,877, Cl. 84-453.000.
Okamoto, Miyoshi; Yoshida, Syusuke; and Inada, Shigeru, to Toray Industries, Inc. Woven fabric. 4,234,022, Cl. 139-420.00R.
Okamoto, Taira: *See*—
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.
O'Keefe, David B.: *See*—
Bruce, Kenneth E.; Barlow, George J.; Conway, John W.; Lombardo, Ralph M., Jr.; Bradley, John J.; and O'Keefe, David B., 4,234,919, Cl. 364-200.000.
Okita, Koichi, to Sumitomo Electric Industries, Ltd. Process for producing porous polytetrafluoroethylene tubings. 4,234,535, Cl. 264-519.000.
Okumura, Akira, to Matsumoto, Tetsuo; Okumura, Eiko; and Hitachi Koki Company, Limited. Method and instrument fo. photometric analysis of liquid using centrifuge rotor. 4,234,799, Cl. 250-576.000.
Okumura, Eiko: *See*—
Okumura, Akira, 4,234,799, Cl. 250-576.000.
Okuyama, Hiroshi: *See*—
Yamagisi, Kikuo; Okuyama, Hiroshi; and Kawaguchi, Hideo, 4,234,300, Cl. 425-363.000.
Olabisi, Olagoke, to Union Carbide Corporation. Molded plastic structural web articles. 4,234,642, Cl. 428-188.000.
Olin Corporation: *See*—
Scott, Robert N.; Gavin, David F.; and Milnes, Frank J., 4,234,441, Cl. 252-78.300.
Oliver, George A. Mass measuring apparatus. 4,234,049, Cl. 177-105.000.
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, to SKF Kugellagerfabriken GmbH. Mechanism for the axial shifting of an anti-friction bearing. 4,233,855, Cl. 74-396.000.
Olson, Alvin E., to Allwood, Inc. Method for preventing the splitting of logs during drying. 4,233,753, Cl. 34-16.500.
Olympus Optical Co., Ltd.: *See*—
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,234,023, Cl. 141-99.000.
Takase, Hiroshi, 4,234,243, Cl. 350-226.000.
Omar, Alejandro G. Construction of reactor-driven articulated trains with elevated tracks. 4,233,908, Cl. 105-3.000.
Omholt, Ray E. Resiliently cushioned adhesive-applied wood flooring system and method of making the same. 4,233,793, Cl. 52-390.000.
Omori, Norio; Fujisawa, Hideya; Kawashima, Yutaka; Kawai, Hisasi; Iwase, Kazuo; and Ninomiya, Masakazu, to Nippondenso Co., Ltd.; and Nippon Soken, Inc., part interest to each. Method for controlling ignition timing of internal combustion engine. 4,233,944, Cl. 123-416.000.
Omori, Yukio: *See*—
Takahashi, Mitsuru; Omori, Yukio; Ikeda, Shuji; and Kataoka, Hiroyoshi, 4,234,466, Cl. 260-17.00A.
O'Mullan, Norman P.; and Hahn, Paul R. T. Frame for securing flexible sheets of material. 4,233,765, Cl. 40-156.000.
Ondetti, Miguel A.; Gordon, Eric M.; and Ryono, Denis E., to E. R. Squibb & Sons, Inc. Pyroglutamic acid derivatives and analogs. 4,234,489, Cl. 260-326.420.
O'Neil, James P., to Automation Designs, Inc. Drive mechanism for a pick-and-place unit. 4,234,223, Cl. 294-88.000.
Onishi, Ken; and Tanaka, Kunimaro, to Mitsubishi Denki Kabushiki Kaisha. PCM Recording and reproducing system. 4,234,896, Cl. 360-32.000.
Ono Pharmaceutical Co. Ltd.: *See*—
Hayashi, Masaki; Ohuchida, Shuichi; and Arai, Yoshinobu, 4,234,597, Cl. 424-274.000.
Onoda, Hiroshi: *See*—
Nakai, Toshio; Kuzuya, Susumu; Asai, Akira; Iwase, Takayuki; Onoda, Hiroshi; and Nakamura, Kazuo, 4,234,262, Cl. 400-175.000.

Onopchenko, Anatoli: *See*—
Schulz, Johann G.; Onopchenko, Anatoli; and Sabourin, Edward T., 4,234,743, Cl. 562-457.000.

Onuki, Keiichi; Nakagawa, Tohru; and Kenma, Shigeyuki, to Hitachi, Ltd. Adjustment prevention mechanism for carburetor. 4,234,523, Cl. 261-41.00D.

Optimizer Control Corporation: *See*—
Collins, Thomas W., 4,234,850, Cl. 328-66.000.

Orem, Donald E.; Holmes, Vernon P.; and Bacsanyi, Thomas J., to Ransburg Corporation. Dynamic imbalance determining system. 4,234,200, Cl. 279-2.00A.

Organisation Europeenne de Recherches Spatiales: *See*—
Fournet, Maurice, 4,234,789, Cl. 250-234.000.

Osaka Soda Co. Ltd.: *See*—
Matoba, Yasuo, 4,234,705, Cl. 525-329.000.

Osaka, Susumu: *See*—
Toda, Minoru; and Osaka, Susumu, 4,234,245, Cl. 350-269.000.

Ose, Gunter: *See*—
Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, 4,234,808, Cl. 310-49.00R.

Ota, Hiroshi: *See*—
Horigome, Eiji; Ota, Hiroshi; and Azegami, Hitoshi, 4,234,438, Cl. 252-62.540.

Ota, Mitsuharu; Yoshida, Isao; and Nakano, Hiromitsu, to Matsushita Electric Industrial Co., Ltd. Speed control apparatus for DC motor. 4,234,835, Cl. 318-317.000.

Otake, Michiko, to Takara Co., Ltd. Packaging for toy articles and the like. 4,234,079, Cl. 206-45.340.

Otis Engineering Corporation: *See*—
Lane, William C., 4,234,167, Cl. 254-291.000.

Otis, George A. Light transmitting roadway marker. 4,234,265, Cl. 404-16.000.

Outteridge, David A. J.: *See*—
Lobach, James L.; Outteridge, David A. J.; and Colwell, Gary D., 4,234,290, Cl. 415-145.000.

Owens-Corning Fiberglas Corporation: *See*—
Canfield, Sheldon A., 4,233,837, Cl. 73-144.000.

Owens-Illinois, Inc.: *See*—
Kontz, Robert F., 4,234,297, Cl. 425-174.400.

Ozaki, Satoru; Ochi, Yoshiharu; and Matsumura, Kazuo, to Tokyo Shibaura Electric Co., Ltd. Nuclear fuel element. 4,234,385, Cl. 176-68.000.

Ozen Corporation: *See*—
Shiseki, Yutaka, 4,234,193, Cl. 274-1.00A.

Paar, Mark W.: *See*—
Smith, David W.; and Paar, Mark W., 4,233,709, Cl. 17-1.00F.

Paaren, Herbert E.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Hamer, David E.; and Paaren, Herbert E., 4,234,495, Cl. 260-397.200.

Pacer Systems, Inc.: *See*—
Horwitz, Joshua, 4,233,756, Cl. 35-12.00F.

Packaging Corporation of America: *See*—
Champlin, Charles L., 4,234,081, Cl. 206-147.000.

Packman, Elias W.; and Jeffkin, Ruth. Antihistamine and methods for use thereof. 4,234,566, Cl. 424-47.000.

Page Engineering Company: *See*—
Ryerson, Robert W., 4,233,761, Cl. 37-142.00R.

Pallos, Ferenc M.: *See*—
DeBaun, Jack R.; Pallos, Ferenc M.; and Gutman, Arnold D., 4,234,593, Cl. 424-272.000.

Palmer, David A.: *See*—
Schroeder, Hobe; and Palmer, David A., 4,234,494, Cl. 260-346.700.

Palmer, John P.; and Rose, Scott M., to General Dynamics Corporation, Pomona Division. Electrostatic fiber optic scanning device. 4,234,788, Cl. 250-227.000.

Pampuch, Klaus: *See*—
Gronau, Manfred; Mascher, Werner; and Pampuch, Klaus, 4,233,971, Cl. 128-202.260.

Pandak, Zoltan I. Combination toothbrush carrier and holder. 4,234,087, Cl. 206-362.200.

Pandjiris Weldment Co., The: *See*—
Jennings, G. B., 4,234,834, Cl. 318-285.000.

Panicci, Richard L., to Kiddie Products, Inc. End closure. 4,233,714, Cl. 24-201.00R.

Paoletti, Ugo; and Volterra, Alessandro, to Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process and device for the continuous spinning of viscose rayon. 4,234,312, Cl. 8-151.200.

Paparella, James B., to American Publishing Corporation. Imitation wall switch. 4,234,774, Cl. 200-330.000.

Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of monoaryl thioureas. 4,234,513, Cl. 564-26.000.

Park, Dong-Sil; Breiter, Manfred W.; and King, Rendall N., to General Electric Company. Composite sulfur electrode container and method of manufacture. 4,234,668, Cl. 429-163.000.

Park Energy Company: *See*—
Werner, Frank D., 4,233,963, Cl. 126-450.000.

Parkin, Claude E.: *See*—
Rogers, Philip W.; and Parkin, Claude E., 4,233,926, Cl. 116-208.000.

Parlee-Anderson Corporation: *See*—
Anderson, Robert N.; and Parlee, Norman A. D., 4,234,383, Cl. 176-37.000.

Parlee, Norman A. D.: *See*—
Anderson, Robert N.; and Parlee, Norman A. D., 4,234,383, Cl. 176-37.000.

Pascarella, Vincent J.: *See*—
McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., 4,234,399, Cl. 204-159.150.

Pashalis, Crysis: *See*—
Swanson, Harold N.; and Pashalis, Crysis, 4,234,216, Cl. 285-93.000.

Pastor, Stephen D.; and Ganslaw, Stuart H., to National Starch and Chemical Corporation. Pressure sensitive hot melt adhesive curable by exposure to electron beam radiation. 4,234,662, Cl. 428-500.000.

Pastore, Ronald, to Cal Pak Industries, Inc. Cup dispenser employing universal adjustment apparatus. 4,234,101, Cl. 221-241.000.

Patel, Dhiru B., to Barber-Colmar Company. Photoelectric heddle detection device. 4,233,716, Cl. 28-187.000.

Paton, Neil E.: *See*—
Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., 4,233,829, Cl. 72-38.000.

Patrascu, Sorin: *See*—
Voinea, Vasile; Catuneanu, Vasile; Birzu, Ioan; Teisanu, Eugen; Voinea, Maria I.; and Patrascu, Sorin, 4,234,794, Cl. 250-416.0TV.

Patuzzi, Alexander; Riegler, Ernst; and Schmidt, Manfred, to Voest-Alpine Aktiengesellschaft. Mixing arrangement. 4,234,171, Cl. 266-248.000.

Patz, Gary L.; and Davenport, Donald E., to Hexcel Corporation. Electrically conductive prepreg materials. 4,234,648, Cl. 428-245.000.

Paul Revere Corporation: *See*—
Fischer, Thomas R.; and Stelzer, Robert A., 4,233,804, Cl. 56-104.000.

Pearlman, Samuel, to RCA Corporation. CRT Screen structure produced by photographic method. 4,234,669, Cl. 430-25.000.

Peck, Richard O.: *See*—
Ramon, Thomas; and Peck, Richard O., 4,233,745, Cl. 33-174.00L.

Peer, George J.; and Bradley, Robert C., to Multi-Metal Wire Cloth Inc. Filtering septum. 4,234,430, Cl. 210-489.000.

Peiffer, Robert W., to Du Pont de Nemours, E. I., and Company. Producing printed circuits by conjoining metal powder images. 4,234,626, Cl. 427-97.000.

Pellico, Michael A. Antifouling marine coating composition containing agar, a plasticizer and a strengthening agent. 4,234,340, Cl. 106-15.050.

Penneck, Richard J.: *See*—
Clabburn, Robin J. T.; and Penneck, Richard J., 4,233,731, Cl. 29-859.000.

Pennino, Frank L.: *See*—
Kuenzig, Ernest O.; and Pennino, Frank L., 4,234,299, Cl. 425-292.000.

Pennwalt Corporation: *See*—
Hensley, Steve L., 4,233,816, Cl. 62-55.000.
Radice, Peter F., 4,234,868, Cl. 340-146.3SY.

Perakh, Mark; Ginsburg, Hana; Salomon, Erna; Shargorodsky, Valentina; and Rubinstein, Liuba. Chromium plating. 4,234,396, Cl. 204-51.000.

Perchenok, Mark B.: *See*—
Burenkov, Nikolai A.; Ioganson, Rikhard A.; Perchenok, Mark B.; Kuprianov, Alexandr V.; Chegodaev, Evgeny V.; and Chulin, Valentin I., 4,234,809, Cl. 310-105.000.

Perkin-Elmer Corporation, The: *See*—
deMey, Charles F., II; and Helms, Charles C., 4,234,790, Cl. 250-238.000.

Perkins, John A., to Perky & Me Co. Hand catapult device. 4,233,952, Cl. 124-5.000.

Perky & Me Co.: *See*—
Perkins, John A., 4,233,952, Cl. 124-5.000.

Perl, Horst: *See*—
Nussbaumer, Dietmar; and Perl, Horst, 4,234,528, Cl. 264-41.000.

Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, to Abbott Laboratories. Prostaglandin derivatives. 4,234,720, Cl. 542-413.000.

Perrault, Ronald. Work cabinet for podiatrists, dentist and the like. 4,233,782, Cl. 51-5.00R.

Person, Abraham; Wetmore, Sherman B.; and McNary, James F., to Global Marine, Inc. Deployment, release and recovery of ocean riser pipes. 4,234,269, Cl. 405-195.000.

Pesando, Mario A., to DAF Indal Ltd. Traversing and housing system for helicopters. 4,234,143, Cl. 244-116.000.

Peter, Heinrich: *See*—
Muller, Beat; Schneider, Peter; Peter, Heinrich; and Bickel, Hans, 4,234,578, Cl. 424-246.000.

Peter, Julius; Drossler, Heinz-Gunter; and Bachmann, Willi, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic vehicle tire. 4,234,029, Cl. 152-354.0RB.

Peters, David L., to Singer Company, The. Image drift correction apparatus. 4,234,893, Cl. 358-180.000.

Petersen, Uwe; Voss, Eckart; Metzger, Karl G.; and Stadler, Peter, to Bayer Aktiengesellschaft. 1-N-4,6-di-O-(Aminoglycosyl)-1,3-diamino-cyclitol derivatives, processes for their preparation and their use. 4,234,572, Cl. 424-180.000.

Petko, Wayne W.: *See*—
Hevey, Richard C.; Malmros, Mark K.; and Petko, Wayne W., 4,234,680, Cl. 435-7.000.

Petrov, Vyacheslav V.; and Krjuchin, Andrei A. Process for producing material sensitive to electromagnetic and corpuscular radiation. 4,234,625, Cl. 427-74.000.

Petrzilka, Martin, to Firmenich, S.A. Process for the preparation of γ, δ-unsaturated esters and acids. 4,234,741, Cl. 560-211.000.

Petschke, Glenn H.: *See—*
Earing, Mason H.; Gielinski, Leonard H.; Martin, Paul F.; and Petschke, Glenn H., 4,234,714, Cl. 528-67.000.

Pezdirtz, Karl F.: *See—*
Jeremiah, Thomas L.; and Pezdirtz, Karl F., 4,234,955, Cl. 371-51.000.

Pezzoli, Paul A., to Dow Chemical Company, The. Asbestos treatment. 4,234,377, Cl. 162-3.000.

Pfahler, Gerhard: *See—*
Wiezer, Hartmut; Korbanka, Helmut; and Pfahler, Gerhard, 4,234,471, Cl. 260-45.80N.

Pfeifer, Rolf, to Siemens Aktiengesellschaft. X-ray diagnostic installation for x-ray photographs. 4,234,928, Cl. 364-571.000.

Pfiffner, Albert: *See—*
Chodnekar, Madhukar S.; Loeliger, Peter; Schwieter, Ulrich; Pfiffner, Albert; Suchy, Milos; and Zurflun, Rene, 4,234,598, Cl. 424-278.000.

Pfizer Inc.: *See—*
Barth, Wayne E., 4,234,579, Cl. 424-246.000.

Phillips, Barry A.; Spitler, Keith G.; and Keegan, Richard E., to Mobay Chemical Corporation. Polyols derived from 4,4,4-trichloro-1,2-epoxybutane and/or epihalohydrin for use in the production of heat sealable foams. 4,234,745, Cl. 568-614.000.

Phillips Petroleum Company: *See—*
Kelley, Carl S., 4,234,410, Cl. 208-57.000.
Moberly, Charles W.; Welch, Melvin B.; and Fodor, Lawrence M., 4,234,710, Cl. 526-125.000.
Scott, Richard L., 4,234,315, Cl. 23-230.0PC.
Strope, Daniel J., 4,234,454, Cl. 252-429.00R.
Thorsrud, Agmund K.; and Siedenstrang, Roy W., 4,234,636, Cl. 428-95.000.
Wu, Yulin; and Marwil, Stanley J., 4,234,752, Cl. 585-640.000.

Phipps, Arthur L., to Condec Corporation. Method and apparatus for shaping plastic foams. 4,234,529, Cl. 264-51.000.

Photis, James M., to Stauffer Chemical Company. Process for preparing cyanohydrin esters. 4,234,505, Cl. 260-465.00D.

Photis, James M., to Stauffer Chemical Company. Process for preparing cyanohydrin esters. 4,234,506, Cl. 260-465.00D.

Photis, James M., to Stauffer Chemical Company. Process for preparing cyanohydrin esters. 4,234,507, Cl. 260-465.00D.

Photis, James M., to Stauffer Chemical Company. Process for preparing cyanohydrin esters. 4,234,508, Cl. 260-465.00D.

Photis, James M., to Stauffer Chemical Company. Process for preparing thienylglyoxylic acids and amides. 4,234,737, Cl. 549-70.000.

Photis, James M.; Eiseman, Fred S.; and Gister, Sidney M., to Stauffer Chemical Company. Method for preparing glyoxylic acids and derivatives thereof. 4,234,739, Cl. 560-51.000.

Piazza, Matthew R., to Maso Therm Corporation. Composite building module and method for making same. 4,233,787, Cl. 52-125.000.

Pickard, Jurgen: *See—*
Gaus, Hermann; and Pickard, Jurgen, 4,233,861, Cl. 74-763.000.

Pieper, Louis W., to General Electric Company. Methods for making and using slot closure wedges at a coil injection station. 4,233,728, Cl. 29-596.000.

Piepho, Ralf F. Apparatus for the purification of oily emulsions, solutions, and industrial waste waters. 4,234,424, Cl. 210-771.000.

Pinner, Alan L.: *See—*
Hurst, Robert G.; and Pinner, Alan L., 4,233,929, Cl. 118-50.000.

Pipes, William F.; Millsap, Roy V.; McClure, Richard W.; and Hooper, Harrison G., to Lathem Time Recorder Co., Inc. Radio synchronized time-keeping apparatus and method. 4,234,958, Cl. 375-107.000.

Piterskikh, Georgy P.; Sukhov, Stanislav A.; Slobodchikov, Vladimir B.; and Rybalchenko, Gleb F. Apparatus for spraying fluid and paste-like materials. 4,234,525, Cl. 261-89.000.

Pitney Bowes Inc.: *See—*
Beck, Christian A., 4,234,248, Cl. 355-3.0FU.

Pizzino, Carmine P. Compound hair roller. 4,234,000, Cl. 132-39.000.

Place, Kenneth T.: *See—*
Ramras, Daniel, 4,234,446, Cl. 252-187.00R.

Platt, John R.; and Benno, Edward L., to Illinois Tool Works Inc. Two-way container package. 4,234,082, Cl. 206-150.000.

Poate, John M.: *See—*
Celler, George K.; Kimerling, Lionel C.; Leamy, Harry J.; Poate, John M.; and Rozgonyi, George A., 4,234,358, Cl. 148-1.500.

Poehlmann, Paul W. Knife with removable blade. 4,233,737, Cl. 30-335.000.

Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft: *See—*
Berthold, Heinz; and Zimmer, Karl E., 4,234,077, Cl. 198-712.000.

Poirier d'Ange d'Orsay, Emmanuel J., to Societe pour l'Equipement de Vehicules. Device for producing and distributing high tension to the spark plugs of an internal combustion engine. 4,233,949, Cl. 123-634.000.

Polaroid Corporation: *See—*
Brinkley, Robert G., 4,234,486, Cl. 260-314.500.

Poley, Kenneth P.: *See—*
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 4,233,920, Cl. 114-56.000.

Pollution Control Industries, Inc.: *See—*
Kenly, William L., V; Grefe, William O.; and Lawrence, Walter H., 4,234,800, Cl. 250-540.000.

Pommier, Jean, to Compagnie Generale des Etablissements Michelin. Radial tire with high angle, low elongation plies and low angle, high elongation plies in belt. 4,234,031, Cl. 152-356.00R.

Ponticello, Gerald S.: *See—*
Baldwin, John J.; and Ponticello, Gerald S., 4,234,590, Cl. 424-263.000.

Porchia, Eliseo, to Autovox. Device for the detection of the state of rotation of a shaft, in particular for tape decks. 4,234,139, Cl. 242-191.000.

Porter, John R., to Porter-Way Harvester Manufacturing Co., Inc. Harvesting machine feeder apparatus. 4,234,045, Cl. 171-14.000.

Porter-Way Harvester Manufacturing Co., Inc.: *See—*
Porter, John R., 4,234,045, Cl. 171-14.000.

Possati, Mario, to Finike Italiana Marposs S.p.A. Apparatus for the geometrical checking of workpieces having surfaces of rotation. 4,233,744, Cl. 33-143.00L.

Postle, Stephen R., to Ciba-Geigy AG. Pyrazolone dyestuffs and their use in photographic materials. 4,234,677, Cl. 430-518.000.

Potapov, Valery N.: *See—*
Lidorenko, Nikolai S.; Litsenko, Tatyana A.; Potapov, Valery N.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S., 4,234,354, Cl. 136-246.000.

Potter Electric Signal Co.: *See—*
Baker, Robert K., 4,234,879, Cl. 340-686.000.

Pouliquen, Jean: *See—*
Defebvre, Andre; and Pouliquen, Jean, 4,233,849, Cl. 73-812.000.

PPG Industries, Inc.: *See—*
Graham, Roy R., 4,233,809, Cl. 57-250.000.
Mazzoni, Renato J.; and Shoop, Vernon A., 4,233,796, Cl. 52-789.000.

Prange, Uwe: *See—*
El-Chahawi, Moustafa; and Prange, Uwe, 4,234,545, Cl. 423-138.000.

Pratt, George W., Jr., to Massachusetts Institute of Technology. Method of assessing performance potential of a quadruped. 4,233,845, Cl. 73-432.00R.

Prause, Benjamin G.; and Meyers, John D., to D & W International, Inc. Apparatus for measuring the length of pipe and other hollow members. 4,234,942, Cl. 367-128.000.

Precitronic Gesellschaft fur Feinmechanik und Electronic mbH: *See—*
Eichweber, Kurt, 4,233,882, Cl. 89-1.00L.

Preston, George T.: *See—*
Mallan, George M.; and Preston, George T., 4,234,388, Cl. 201-25.000.

Prevotat, Gerard, to Alsthom-Unelec. Robust polyphase transformer. 4,234,862, Cl. 336-5.000.

Price, Earl T.: *See—*
Hamada, James H.; Bender, Jeffrey R.; Price, Earl T.; and Ingebretsen, Dennis A., 4,234,306, Cl. 433-55.000.

Price, Linda D. Head-supported illumination device. 4,234,910, Cl. 362-105.000.

Priegnitz, James W., to UOP Inc. Process for the separation of isomers of chloronitrobenzene. 4,234,520, Cl. 568-937.000.

Prince Manufacturing Co., Inc.: *See—*
Bash, C. Malcolm, 4,233,953, Cl. 124-56.000.

Pringle, William L., to Friedman, Leonard. Bonding apparatus for brake linings. 4,233,893, Cl. 100-93.0PB.

Pringle, William L., to United States Steel Corporation. Axle housing assembly. 4,234,120, Cl. 228-173.00C.

Printronix, Inc.: *See—*
Barrus, Gordon B.; and Matula, Jerry, 4,233,894, Cl. 101-93.040.

Process Analyzers, Inc.: *See—*
Carter, Harold V.; and Durfee, Frederick G., 4,234,257, Cl. 356-417.000.

Procter & Gamble Company, The: *See—*
Gunther, Harald; and Fleisch, Herbert C., 4,234,645, Cl. 424-204.000.
Lewis, Neal A., 4,234,613, Cl. 426-430.000.
Schilling, Kenneth J., 4,234,627, Cl. 427-242.000.
Tofe, Andrew J.; and Francis, Marion D., 4,234,562, Cl. 424-1.000.

Proctor, Douglas B. I. Paddles for boats. 4,233,925, Cl. 440-101.000.

Produits Chimiques Ugine Kuhlmann Service Propriete Industrielle: *See—*
Brouard, Claude M. H. E.; and Stiot, Jean-Pierre H., 4,234,482, Cl. 260-187.000.

Protim International Limited: *See—*
Hurst, Robert G.; and Pinner, Alan L., 4,233,929, Cl. 118-50.000.

Pruden, Barry B.: *See—*
Nandi, Biswa N.; Belinko, Keith; Ciavaglia, Lynn A.; Pruden, Barry B.; and Denis, Jean-Marie D., 4,234,387, Cl. 201-23.000.

Prumm, Georg J. Electronic coin tester with controlled mechanical testing device. 4,234,072, Cl. 194-100.00A.

Przybylinski, Thomas L.; and Tylisz, Eugene R., to Pullman Incorporated. Trough hatch locking device. 4,234,221, Cl. 292-256.500.

Psarras, Theodore: *See—*
United States of America, National Aeronautics and Space Administration; Rosser, Robert W.; and Psarras, Theodore, 4,234,715, Cl. 528-362.000.

Pulley, Howard; and Seltzer, Steven F., to United States of America, Energy. Removal of uranium from aqueous HF solutions. 4,234,555, Cl. 423-484.000.

Pullman Incorporated: *See—*
Przybylinski, Thomas L.; and Tylisz, Eugene R., 4,234,221, Cl. 292-256.500.
Rywak, Donald E.; Griffith, James L.; Rhodes, Frederick D.; and Kovalsics, Otto, 4,234,106, Cl. 222-239.000.

Snyder, Richard C.; and Bodinger, Donald C., 4,233,795, Cl. 52-514.000.

Pumphrey, Nicholas W. J.: *See—*
Hesketh, Bernard; and Pumphrey, Nicholas W. J., 4,234,405, Cl. 204-290.00F.

Purex Corporation: *See—*
Maxey, Eugene R., 4,234,819, Cl. 315-119.000.

Putz, Hermann, to Hoerbiger & Co. Method of producing sintered friction laminae. 4,234,337, Cl. 75-208.00R.

Pyle, Jeffrey A.: *See—*
Ford, Daniel E.; and Pyle, Jeffrey A., 4,233,748, Cl. 33-180.00R.

Quester, Karl W.; Gontgen, Josef; and Muller, Adolf, to Firm Wilh. Quester. Rib roller for processing tobacco ribs. 4,233,997, Cl. 131-147.00R.

Quick, David C., to Allis-Chalmers Corporation. Multiple speed transmission with auxiliary transfer drive. 4,233,857, Cl. 74-665.0GA.

Quinn, David R.; and Wesner, Walter H., to AFA Corporation, The. Nozzle assembly. 4,234,128, Cl. 239-478.000.

Rabenau, Albrecht; von Alpen, Ulrich; Schonherr, Erich; and Muller, Gertraude, to Max-Planck-Gesellschaft zur forderung der Wissenschaften e.V. Stable crystalline lithium nitride and process for its preparation. 4,234,554, Cl. 423-409.000.

Radey, Ross T., Jr. Smoking apparatus. 4,233,998, Cl. 131-175.000.

Radice, Peter F., to Pennwalt Corporation. Personal verification device. 4,234,868, Cl. 340-146.3SY.

Raemer, Daniel B.; Gehmlich, Dietrich K.; and Westenskow, Dwayne R., to University of Utah. Apparatus for measurement of expiration fluids. 4,233,842, Cl. 73-861.040.

Rain Bird Sprinkler Mfg. Corp.: *See—*
Morgan, Norman D., 4,234,126, Cl. 239-230.000.

Ralston Purina Company: *See—*
Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., 4,234,604, Cl. 426-2.000.
Witte, Philip A., 4,234,609, Cl. 426-104.000.

Ramme, Clarence. Lighted bobber for a fishing line. 4,234,913, Cl. 362-158.000.

Ramon, Thomas; and Peck, Richard O., to Amsted Industries Incorporated. Warpage gage. 4,233,745, Cl. 33-174.00L.

Ramras, Daniel, to Place, Kenneth T. Method and apparatus for producing chlorine dioxide. 4,234,446, Cl. 252-187.00R.

Ranby, Bengt G.: *See—*
Flodin, Per G. M.; Komlos, Peter G.; and Ranby, Bengt G., 4,234,565, Cl. 424-33.000.

Rane, Dinanath F.: *See—*
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,234,685, Cl. 435-80.000.

Rank Organization Limited, The: *See—*
Moore, William T.; and Sweeney, Michael T., 4,234,240, Cl. 350-6.100.

Ransburg Corporation: *See—*
Orem, Donald E.; Holmes, Vernon P.; and Bacsanyi, Thomas J., 4,234,200, Cl. 279-2.00A.

Rapoport, Henry; and Snyder, Clinton D., to University of California, The Regents of the. Metallo-substituted naphthalene. 4,234,746, Cl. 568-633.000.

Rary, James K.: *See—*
McDonough, John C.; Rary, James K.; Birth, Arden; and Kuzma, John J., Jr., 4,234,370, Cl. 156-95.000.

Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, to Ciba-Geigy Corporation. Nickel stabilizers for synthetic polymers. 4,234,723, Cl. 544-64.000.

Rasberger, Michael: *See—*
Rody, Jean; and Rasberger, Michael, 4,234,699, Cl. 525-55.000.
Rody, Jean; and Rasberger, Michael, 4,234,700, Cl. 525-55.000.

Rask, Eric H., to General Electric Company. Motor operated circuit breaker including a variable drive coupling link assembly. 4,234,772, Cl. 200-153.00V.

Raychem Corporation: *See—*
Greuel, Walter J., Jr., 4,234,020, Cl. 138-166.000.

Raychem Limited: *See—*
Clabburn, Robin J. T.; and Penneck, Richard J., 4,233,731, Cl. 29-859.000.
Rogers, Albert G., 4,234,218, Cl. 285-162.000.

Raymond, Joseph H., Jr.; and Lien, Jih-Chang, to Texas Instruments Incorporated. Metal-to-moat contacts in N-channel silicon gate integrated circuits using discrete second-level polycrystalline silicon. 4,234,889, Cl. 357-71.000.

Raytheon Company: *See—*
DeCou, Donald F.; and Roach, Terence, 4,234,792, Cl. 250-361.00R.
Schmoock, James C., 4,234,806, Cl. 307-273.000.

RCA Corporation: *See—*
Astle, Brian; and Dischert, Robert A., 4,234,890, Cl. 358-10.000.
Chen, Hsing-Yao; and Hughes, Richard H., 4,234,814, Cl. 313-412.000.
Credelle, Thomas L., 4,234,815, Cl. 313-422.000.
den Hollander, Willem, 4,234,824, Cl. 315-371.000.
Dietz, Wolfgang F. W., 4,234,826, Cl. 315-393.000.
Gange, Robert A., 4,234,825, Cl. 315-383.000.
Larach, Simon; and Vilkomerson, David H. R., 4,233,989, Cl. 128-661.000.
Longsderff, Richard W.; and Henry, Dale V., 4,233,936, Cl. 118-726.000.
Pearlman, Samuel, 4,234,669, Cl. 430-25.000.
Schade, Otto H., Jr., 4,234,841, Cl. 323-1.000.
Toda, Minoru; and Osaka, Susumu, 4,234,245, Cl. 350-269.000.
Willis, Donald H., 4,234,827, Cl. 315-408.000.
Willis, Donald H., 4,234,829, Cl. 315-411.000.

Rea, Wayne E., to Dresser Industries, Inc. Silencer-separator with internal trap for liquid seal blowers or the like. 4,234,325, Cl. 55-185.000.

Reavill, Joseph A.; and Arachi, John M., to General Dynamics Corporation, Pomona Division. Method and apparatus for vacuum lamination of flex circuits. 4,234,373, Cl. 156-382.000.

Rebel, Herbert, to M.A.N.-Roland Druckmaschinenfabrik Faber & Schleicher AG. Prevention of impact in impression cylinder of sheet-fed lithographic press. 4,233,899, Cl. 101-142.000.

Rechin, Francis J.; and Vargo, Edward J., to TRW Inc. Method of charging a crucible. 4,234,336, Cl. 75-65.00R.

Redeker, Maynard S.: *See—*
Allen, Kenneth P.; and Redeker, Maynard S., 4,234,938, Cl. 367-24.000.

Redford, David A.: *See—*
Goss, Michael J.; and Redford, David A., 4,233,840, Cl. 73-153.000.

Reed, Geoffrey R.: *See—*
Laws, William R.; and Reed, Geoffrey R., 4,233,959, Cl. 126-426.000.

Reed International Limited: *See—*
Thompson, David R.; and Tomlinson, John P., 4,234,641, Cl. 428-159.000.

Reed, Joseph F.: *See—*
Kotuby, Paul M.; and Reed, Joseph F., 4,233,995, Cl. 131-133.00R.

Reedy, Charles E.: *See—*
Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., 4,234,158, Cl. 251-144.000.
Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., 4,234,159, Cl. 251-144.000.

Regie Nationale des Usines Renault: *See—*
Fontanet, Pierre; and Desjardins, Georges, 4,234,522, Cl. 261-23.00A.

Reilich, William M.: *See—*
Mailloux, Louis D.; and Reilich, William M., 4,234,250, Cl. 355-4.000.

Reinhard Mohn GmbH: *See—*
Beckert, Alexander; and Dudziak, Ernst, 4,234,178, Cl. 270-45.000.

Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., to National Petro Chemicals Corporation. Olefin polymerization catalyst. 4,234,453, Cl. 252-428.000.

Rekers, Louis J.; and Katzen, Stanley J., to National Petro Chemicals Corporation. Catalyst composition, method for producing same and method for polymerization of 1-olefins with same. 4,234,709, Cl. 526-100.000.

Reliable Electric Company: *See—*
Jackula, Michael J.; and Ziegler, Hans J., 4,234,756, Cl. 174-38.000.

Renner, Hans J.: *See—*
Jockel, Heinz; Moller, Friedrich W.; Renner, Hans J.; and Krumm, Hagen, 4,234,451, Cl. 252-373.000.

Research Corporation: *See—*
Bahl, Om P., 4,234,561, Cl. 424-1.000.
Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., 4,234,476, Cl. 260-112.00R.
Enke, Christie G.; Yost, Richard A.; and Morrison, James D., 4,234,791, Cl. 250-281.000.

Research Institute for Medicine & Chemistry Inc.: *See—*
Barton, Derek H. R.; and Hesse, Robert H., 4,234,515, Cl. 564-114.000.

Restaurant Technology, Inc.: *See—*
Schindler, James; and Nugarus, Anthony R., 4,233,891, Cl. 99-348.000.

Reuvekamp, Antonius H. J.: *See—*
Dijkmans, Eise C.; Ijff, Barend; and Reuvekamp, Antonius H. J., 4,234,763, Cl. 179-77.000.

Rhine, Samuel, to Helena Laboratories Corporation. Paper tensioning device. 4,234,134, Cl. 242-55.200.

Rhodes, Cecil C.; and Kozar, Robert S., to Amsted Industries Incorporated. System for separating particulate matter into soluble and insoluble portions. 4,234,429, Cl. 423-109.000.

Rhodes, Eugene E., to Ford Motor Company. Method for manufacturing a heat transfer assembly. 4,233,719, Cl. 29-157.30A.

Rhodes, Frederick D.: *See—*
Rywak, Donald E.; Griffith, James L.; Rhodes, Frederick D.; and Kovalsics, Otto, 4,234,106, Cl. 222-239.000.

Rhudy, John S.; and Gibb, Connie L., to Marathon Oil Company. Recovery of petroleum with chemically treated high molecular weight polymers. 4,234,433, Cl. 252-8.55D.

Rhythm Watch Co., Ltd.: *See—*
Nomura, Yasushi; Komatsu, Yuzo; and Morokawa, Shigeru, 4,234,945, Cl. 368-75.000.

Rich Products Corporation: *See—*
Kahn, Marvin L.; and Eapen, Kuttikandathil E., 4,234,611, Cl. 426-321.000.

Richard, Andre M. E., to Agence Nationale de Valorisation de la Recherche (ANVAR). Device for selecting characteristics of a transmission between a motor and its load. 4,233,862, Cl. 74-866.000.

Richard Wolf GmbH: *See—*
Bauer, Siegfried; and Boebel, Manfred, 4,233,982, Cl. 128-347.000.

Richardson, Charles M. Self-bagging device for powered lawn tools. 4,233,806, Cl. 56-202.000.

Riedel, Tilo, to Sesamat Anstalt. Tire-chain assembly. 4,234,027, Cl. 152-213.00R.

Rieder, Georg: *See*—
Michaud, Horst; Rieder, Georg; and Seeholzer, Josef, 4,234,332, Cl. 71-30.000.
Riegler, Ernst: *See*—
Patuzzi, Alexander; Riegler, Ernst; and Schmidt, Manfred, 4,234,171, Cl. 266-248.000.
Riggle, Ivan E.: *See*—
Botros, Raouf; and Riggle, Ivan E., 4,234,483, Cl. 260-207.100.
Righelato, Renton C.; and Jarman, Trevor R., to Tate & Lyle Limited. Polysaccharide producing process using protease and Azotobacter. 4,234,688, Cl. 435-101.000.
Riken-Denshi Kogyo Kabushiki Kaisha: *See*—
Murai, Hiroshi, 4,234,876, Cl. 340-573.000.
Rikuta, Sotokazu. Control valve for keeping the rate of flow at a fixed value. 4,234,013, Cl. 137-504.000.
Riley, William J., Jr., to Harris Corporation. Control device for a phase lock loop vernier frequency synthesizer. 4,234,929, Cl. 364-701.000.
Rippe, Delfin F., to American Hospital Supply Corporation. Insolubilized deoxyribonucleic acid (DNA). 4,234,563, Cl. 424-8.000.
Risdon Corporation: *See*—
Kotuby, Paul M.; and Reed, Joseph F., 4,233,995, Cl. 131-133.00R.
Riseman, Jacob, to International Business Machines Corporation. Method for forming an insulator between layers of conductive material. 4,234,362, Cl. 148-187.000.
Ristvedt, Victor G.; and Johnson, Roy B. Coin handling machine. 4,234,003, Cl. 133-3.00A.
Ritscher, James S.: *See*—
Stanley, Priscilla B.; and Ritscher, James S., 4,234,549, Cl. 423-245.000.
Ritter, Gerhard: *See*—
Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,233,870, Cl. 83-563.000.
Ritter, Josef: *See*—
Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,233,870, Cl. 83-563.000.
Ritter, Klaus: *See*—
Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,233,870, Cl. 83-563.000.
Rittmaster, Peter A.: *See*—
Booth, John L.; and Rittmaster, Peter A., 4,233,802, Cl. 53-475.000.
Rittscher, Dieter: *See*—
Baatz, Henning; and Rittscher, Dieter, 4,234,798, Cl. 250-506.000.
Rivacoba, Jose U.: *See*—
Torroja, Jaime M.; Rivacoba, Jose U.; and Herrero, Ricardo M., 4,233,921, Cl. 114-74.00R.
Ro-Search, Inc.: *See*—
Auberry, Horace, 4,233,758, Cl. 36-3.00A.
Roach, Terence: *See*—
DeCou, Donald F.; and Roach, Terence, 4,234,792, Cl. 250-361.00R.
Robbins Company, The: *See*—
Robbins, Richard J.; and Spencer, Barry A., 4,234,235, Cl. 299-56.000.
Robbins, Richard J.; and Spencer, Barry A., to Robbins Company, The. Rotary cutterhead for an earth boring machine. 4,234,235, Cl. 299-56.000.
Robert Bosch GmbH: *See*—
Kadelbach, Volker; Will, Gerhard; and Sauer, Joseph, 4,233,860, Cl. 74-752.00A.
Meinders, Horst, 4,234,355, Cl. 148-1.500.
Roberts Corporation: *See*—
Brown, Joe B.; Thompson, Louis I.; and Mishanec, Stephen P., 4,233,907, Cl. 104-172.00B.
Roberts, Kelvin: *See*—
Friberg, Stig E.; and Roberts, Kelvin, 4,234,437, Cl. 252-62.510.
Roberts, Larry W.: *See*—
Long, William J.; Roberts, Larry W.; and Williams, H. Ross, 4,233,800, Cl. 53-381.00R.
Roberts, William M., to Baker International Corporation. Removable subsea test valve system for deep water. 4,234,043, Cl. 166-336.000.
Robertshaw Controls Company: *See*—
Kranz, Max L., 4,233,970, Cl. 128-201.280.
Robinson, Anderson E., Jr., to Hercules Incorporated. Crosslinked double base propellant binders. 4,234,364, Cl. 149-19.400.
Robinson, John G. S. Bait holder. 4,233,771, Cl. 43-41.000.
Robinson, Ward T.; and Nokes, Richard H. Joint unit providing multiple joints. 4,234,263, Cl. 403-405.000.
Rocco, Francesco. Catheter provided with a safety-fixing member, remotely adjustable and expandible by introducing fluids. 4,233,983, Cl. 128-349.00B.
Roche, Christian: *See*—
Gottzein, Eveline; Roche, Christian; and Bohn, Gerhard, 4,233,905, Cl. 104-281.000.
Rockafellow, Duane A.: *See*—
Kaukeinen, Joseph Y.; and Rockafellow, Duane A., 4,234,670, Cl. 430-52.000.
Rockwell International Corporation: *See*—
Bake, Earl A.; and Schoeneweis, E. Frederick, 4,234,011, Cl. 137-312.000.
Darnell, Alfred J., 4,234,551, Cl. 423-263.000.
Eshghy, Siavash, 4,233,721, Cl. 29-407.000.
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Flanagan, Joseph E., 4,234,363, Cl. 149-19.400.
Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., 4,233,829, Cl. 72-38.000.
Hamilton, C. Howard; and Weisert, Edward D., 4,233,831, Cl. 72-60.000.
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Soderqvist, Gunnar M. T.; and Aberg, Ulf L., 4,234,329, Cl. 65-2.000.
Rodgers, James W.: *See*—
Duggins, Richard W.; and Rodgers, James W., 4,233,736, Cl. 30-293.000.
Rody, Jean; and Rasberger, Michael, to Ciba-Geigy Corporation. Polymeric light stabilizers for plastics. 4,234,699, Cl. 525-55.000.
Rody, Jean; and Rasberger, Michael, to Ciba-Geigy Corporation. Polymeric light stabilizers for plastics. 4,234,700, Cl. 525-55.000.
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Rody, Jean: *See*—
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,234,723, Cl. 544-64.000.
Roe, Norman E., to Hehr International, Inc. Window assembly for socket window. 4,233,781, Cl. 49-504.000.
Roesch, Androniki: *See*—
Winter, Werner; Friebe, Walter-Gunar; Kampe, Wolfgang; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,234,585, Cl. 424-250.000.
Rogers, Albert G., to Raychem Limited. Feedthrough device. 4,234,218, Cl. 285-162.000.
Rogers, Philip W.; and Parkin, Claude E., to Mammel, A. Dean. Flange valve having improved sealing characteristics and wear indicator. 4,233,926, Cl. 116-208.000.
Rogers, Walter E.; and Midgett, Preston C. Underground heating and cooling system. 4,234,037, Cl. 165-3.000.
Rogora, Edoardo; and De Angelis, Giancarlo, to Alfa Romeo S.p.A. Device for detecting premature ignition in an internal-combustion engine. 4,233,943, Cl. 123-425.000.
Rohm and Haas Company: *See*—
Emmons, William D.; and Moser, Vincent J., 4,234,711, Cl. 526-282.000.
Killam, H. Scott, 4,234,381, Cl. 162-158.000.
Weir, W. David; and Kilbourn, Edward E., 4,234,575, Cl. 424-204.000.
Rohringer, Peter: *See*—
Hiestand, Armin; and Rohringer, Peter, 4,234,341, Cl. 106-18.220.
Rohto Pharmaceutical Co. Ltd.: *See*—
Hirayama, Masami; Nakata, Tadataka; and Kagayama, Michiko, 4,234,450, Cl. 252-314.000.
RoJohn, D. Scott: *See*—
Dick, Donald E.; Metz, Robert L.; RoJohn, D. Scott; and Elliott, Raymond D., 4,233,988, Cl. 128-660.000.
Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., to ACF Industries, Incorporated. Combination tank car valve skid and valve seat wherein the skid is welded to the valve seat. 4,234,158, Cl. 251-144.000.
Rollins, Dallas W.; Behle, Gunter R.; and Reedy, Charles E., to ACF Industries, Incorporated. Combination tank car valve skid and valve seat in which end portions on the skid are attached to the tank with fasteners which do not require stress relieving of the tank. 4,234,159, Cl. 251-144.000.
Rolls-Royce Limited: *See*—
Ballard, Norman E.; Cork, Frank; Andrews, Philip H.; and Chappell, Francis, 4,234,653, Cl. 428-328.000.
Romine, Donald J., to Bendix Autolite Corporation. Thin coat temperature compensated resistance oxide gas sensor. 4,234,542, Cl. 422-98.000.
Roper Corporation: *See*—
Condon, Richard W., 4,234,050, Cl. 180-190.000.
Rose, Scott M.: *See*—
Palmer, John P.; and Rose, Scott M., 4,234,788, Cl. 250-227.000.
Rosenberg, Eugene: *See*—
Gutnick, David L.; Rosenberg, Eugene; and Shabtai, Yossef, 4,234,689, Cl. 435-101.000.
Rosenvold, Leo. Truck box cover device. 4,234,224, Cl. 296-98.000.
Rosolowski, Joseph H.: *See*—
Arendt, Ronald H.; and Rosolowski, Joseph H., 4,234,436, Cl. 252-62.900.
Arendt, Ronald H.; and Rosolowski, Joseph H., 4,234,557, Cl. 423-593.000.
Arendt, Ronald H.; and Rosolowski, Joseph H., 4,234,558, Cl. 423-593.000.
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United States of America, National Aeronautics and Space Administration; Rosser, Robert W.; and Psarras, Theodore, 4,234,715, Cl. 528-362.000.
Rotex, Inc.: *See*—
Lower, William E.; Mitchell, Stephen C.; and Simpson, Jeremy F., 4,234,416, Cl. 209-247.000.
Rothmans of Pall Mall Canada Limited: *See*—
Brackmann, Warren A.; and DiIanni, Daniel, 4,233,996, Cl. 131-140.00R.
Rouse, Keith M.: *See*—
Margetts, Hugh G.; and Rouse, Keith M., 4,234,061, Cl. 188-71.300.
Rowarth, John E.: *See*—
Royce, John H.; Rowarth, John E.; and Walker, John, 4,233,780, Cl. 49-485.000.

Rowell, Douglas W. Method and apparatus for rolling metal wire or rod into wide, flat strips. 4,233,832, Cl. 72-91.000.
Rowlett, Beb H., to Garrett Corporation, The. Flywheel drive system having a split electromechanical transmission. 4,233,858, Cl. 74-675.000.
Rowley, David S., to Christensen, Inc. Drill bits embodying impregnated segments. 4,234,048, Cl. 175-329.000.
Rowney, Michael H. Swimming pool cover with rain water drainage and filter means. 4,233,695, Cl. 4-498.000.
Royce, John H.; Rowarth, John E.; and Walker, John, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Door seal. 4,233,780, Cl. 49-485.000.
Rozgonyi, George A.: *See—*
Celler, George K.; Kimerling, Lionel C.; Leamy, Harry J.; Poate, John M.; and Rozgonyi, George A., 4,234,358, Cl. 148-1.500.
Rozmus, Walter J., to Kelsey-Hayes Company. Method of forming and ultrasonic testing articles of near net shape from powder metal. 4,233,720, Cl. 29-407.000.
Rual Industries, Inc.: *See—*
Davis, Ariel R.; and Greene, Worthington W., 4,234,767, Cl. 200-1.00R.
Ruark, Joseph S. Line hauler for crab pots and the like. 4,234,164, Cl. 254-371.000.
Rubinstein, Liuba: *See—*
Perakh, Mark; Ginsburg, Hana; Salomon, Erna; Shargorodsky, Valentina; and Rubinstein, Liuba, 4,234,396, Cl. 204-51.000.
Rudd, Wallace C.; and Udall, Humfrey N., to Thermatool Corp. Method of producing areas of alloy metal on a metal part using electric currents. 4,234,776, Cl. 219-76.170.
Ruetenik, Roger R. Folding wing assembly. 4,233,938, Cl. 119-15.50A.
Rug Crafters: *See—*
Montell, Joseph J., 4,233,918, Cl. 112-266.200.
Rummer, James D.: *See—*
Moncaster, Michael B.; and Rummer, James D., 4,234,199, Cl. 277-237.00R.
Ryabikov, Stanislav V.: *See—*
Lidorenko, Nikolai S.; Litsenko, Tatyana A.; Potapov, Valery N.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S., 4,234,354, Cl. 136-246.000.
Rybalchenko, Gleb F.: *See—*
Piterskikh, Georgy P.; Sukhov, Stanislav A.; Slobodchikov, Vladimir B.; and Rybalchenko, Gleb F., 4,234,525, Cl. 261-89.000.
Ryding, Geoffrey, to Nova Associates, Inc. Treating workpieces with beams. 4,234,797, Cl. 250-492.00B.
Ryerson, Robert W., to Page Engineering Company. Earth digging bucket tooth construction having a nose with increased section modulus. 4,233,761, Cl. 37-142.00R.
Ryono, Denis E.: *See—*
Ondetti, Miguel A.; Gordon, Eric M.; and Ryono, Denis E., 4,234,489, Cl. 260-326.420.
Ryrfors, Lars-Olof; and Hassander, Mats S. O., to Hoechst-Perstorp AB. Binder for pressure sensitive adhesive. 4,234,467, Cl. 260-29.70H.
Rywak, Donald E.; Griffith, James L.; Rhodes, Frederick D.; and Kovalsics, Otto, to Pullman Incorporated. Fuel delivery system for a furnace or kiln. 4,234,106, Cl. 222-239.000.
SAB Harmon Industries, Inc.: *See—*
Wilde, Calvin D.; and Turner, Daniel L., 4,234,922, Cl. 364-426.000.
Sabourin, Edward T.: *See—*
Schulz, Johann G.; Onopchenko, Anatoli; and Sabourin, Edward T., 4,234,743, Cl. 562-457.000.
Safety Consulting Engineers Inc.: *See—*
Dahn, C. James, 4,233,835, Cl. 73-35.000.
Safianoff, Albert, to Alpha Therapeutic Corporation. Collection container for sterile liquids. 4,234,095, Cl. 215-232.000.
Sagara, Seiji: *See—*
Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, 4,234,305, Cl. 432-59.000.
Sahar, Raphael. Spinning top. 4,233,774, Cl. 46-82.000.
St. Louis, Harold E.: *See—*
Hay, Robert A., II; and St. Louis, Harold E., 4,234,447, Cl. 252-301.10W.
Saipem, S.p.A.: *See—*
Scodino, Ambrogio, 4,234,268, Cl. 405-158.000.
Saitoh, Osamu: *See—*
Ishida, Kozo; Amimoto, Hiroyuki; and Saitoh, Osamu, 4,234,255, Cl. 350-274.000.
Sakai Chemical Industry Co., Ltd.: *See—*
Iwasaki, Susumu; Nagasawa, Osamu; Takano, Tatsuo; and Matsumoto, Seiji, 4,234,378, Cl. 162-138.000.
Sakakibara, Sakuichi; Sugisawa, Ko; Majima, Junji; and Nakanaga, Ryusuke. Continuous frying method. 4,234,612, Cl. 426-394.000.
Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; Yasukawa, Teruo; and Kamoda, Tamotsu, to House Food Industrial Company, Limited. Method for preparing instant cooking noodles. 4,234,617, Cl. 426-557.000.
Sakamoto, Suguru; Nakazato, Takuzo; Minoshima, Tsugio; and Tanaka, Tohachiro, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Pipe joint construction. 4,234,217, Cl. 285-150.000.
Sakanaka, Yasuhiro; and Narui, Mamoru, to Toyo Soda Manufacturing Company, Limited. Chloroprene polymer composition. 4,234,704, Cl. 525-215.000.
Sakurada, Ichio: *See—*
Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, 4,234,168, Cl. 266-128.000.
Salamone, Joseph L. Bi-delta vane. 4,234,192, Cl. 273-423.000.
Salomon, Erna: *See—*
Perakh, Mark; Ginsburg, Hana; Salomon, Erna; Shargorodsky, Valentina; and Rubinstein, Liuba, 4,234,396, Cl. 204-51.000.
Sandelman, Robert M. Merchandise display and categorical indicators. 4,234,869, Cl. 340-286.00R.
Sandstone, Inc.: *See—*
Williams, William H., 4,234,875, Cl. 340-550.000.
Sandvik Special Metal Corporation: *See—*
Matinlassi, Ulf A., 4,233,834, Cl. 72-208.000.
Sanfilippo, Michele: *See—*
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Sartorio, Lucio A. Oil dipstick cleaning device. 4,233,704, Cl. 15-210.00B.
Sartorius GmbH: *See—*
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Sasai, Koji: *See—*
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Sasaki, Toshihiko. Container for liquid. 4,234,121, Cl. 229-1.50B.
Saskatchewan Power Corporation: *See—*
Barabas, Miklos F.; Cooke, William B.; Hardy, R. H. Stephen; and Verma, Arun, 4,234,782, Cl. 219-365.000.
Sass, Bernard J., to Service d'Exploitation Industrielle des Tabacs. Wrapping process for cigars with natural tobacco. 4,233,994, Cl. 131-58.000.
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 4,5-Dichloro-imidazole-1-carboxylic acid aryl esters. 4,234,722, Cl. 544-58.400.
Sato, Hideo; Kawakami, Kanji; and Nishihara, Motohisa, to Hitachi, Ltd. Strain gauge pressure transducer apparatus having an improved impedance bridge. 4,233,848, Cl. 73-727.000.
Sato, Hiroshi; and Yamamoto, Hironori, to Canon Kabushiki Kaisha. High precision positioning device. 4,234,175, Cl. 269-73.000.
Sato, Kazuyuki: *See—*
Kinoshita, Tsuneo; Sato, Kazuyuki; and Soneoka, Ryusuke, 4,234,921, Cl. 364-424.000.
Sato, Toyoyuki: *See—*
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Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Label strip charging mechanism for hand labeler. 4,233,900, Cl. 101-288.000.
Satoh, Paul S., to Upjohn Company, The. Horizontal electrophoresis or isoelectric focusing apparatus. 4,234,404, Cl. 204-299.00R.
Satoh, Ryosuke: *See—*
Yoshimoto, Shinji; Fujiwhara, Mitsuto; Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Nakagawa, Satoshi, 4,234,678, Cl. 430-564.000.
Satterwhite, Charles R. Aerial conveyor system. 4,234,073, Cl. 198-304.000.
Sauer, Joseph: *See—*
Kadelbach, Volker; Will, Gerhard; and Sauer, Joseph, 4,233,860, Cl. 74-752.00A.
Sauer, Walter; and Gerhart, Berthold, to Hans Giesbert Kommanditgesellschaft. Poultry cage feeding system. 4,233,939, Cl. 119-18.000.
Saunders, Leonard: *See—*
McGauran, Hugh K.; and Saunders, Leonard, 4,233,878, Cl. 85-7.000.
Sawyer, Bobby G.: *See—*
Davis, Wilbur M.; Sawyer, Bobby G.; Nichols, John A.; and Husman, John F., 4,233,803, Cl. 56-14.900.
Saya, Wayne P., to Inventional/Security Development Corp. Alarm system and method thereof. 4,234,874, Cl. 340-539.000.
Scarlett, John C.; and Beggs, Donald, to Midrex Corporation. Apparatus for the direct reduction of iron and production of fuel gas using gas from coal. 4,234,169, Cl. 266-156.000.
Schaad, Willi, to Oehler Whylen Lagertechnik AG. Braking system for freight module on overhead guide rail. 4,234,059, Cl. 188-43.000.
Schade, Otto H., Jr., to RCA Corporation. Self-balancing bridge network. 4,234,841, Cl. 323-1.000.
Schaffer, Claus: *See—*
Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, 4,234,808, Cl. 310-49.00R.
Schelkmann, Wilhelm, to Vakuum Vulk Holdings Limited. Method for repairing and retreading vehicle tires. 4,234,369, Cl. 156-95.000.
Schellenberg, James M.; and Cohn, Marvin, to Westinghouse Electric Corp. Amplifier with radial line divider/combiner. 4,234,854, Cl. 330-286.000.
Scheppele, James E., to TRW Inc. Process for manufacturing emitters by diffusion from polysilicon. 4,234,357, Cl. 148-1.500.
Schering Corporation: *See—*
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,234,685, Cl. 435-80.000.
Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., 4,234,690, Cl. 435-119.000.
Schieber, Franz. Laminar carbon member and a method of manufacturing it. 4,234,650, Cl. 428-280.000.
Schiel, Christian, to J. M. Voith GmbH. Former for a paper machine. 4,234,382, Cl. 162-263.000.
Schieman, Richard D.; and Steffens, John H., to Standard Oil Company. Process for the production of lubricating blend stocks. 4,234,409, Cl. 208-28.000.
Schilling, Kenneth J., to Procter & Gamble Company, The. Fabric conditioning compositions. 4,234,627, Cl. 427-242.000.

Schindler, Donald R., to General Electric Company. Photoflash unit having light-refractive prisms. 4,234,906, Cl. 362-16.000.

Schindler, James; and Nugarus, Anthony R., to Restaurant Technology, Inc. Apparatus for making scrambled eggs. 4,233,891, Cl. 99-348.000.

Schleiermacher, Herbert, to Klockner-Humboldt-Deutz Aktiengesellschaft. Mounting arrangement for mounting a piston compressor attached as an auxiliary machine to an internal combustion engine. 4,233,854, Cl. 74-325.000.

Schliebs, Reinhard: *See*—
La Spina, Andrea; Dietrich, Werner; and Schliebs, Reinhard, 4,234,694, Cl. 521-107.000.

Schlumberger Technology Corporation: *See*—
Coates, George R., 4,233,839, Cl. 73-152.000.

Schmekel, Karl-W.: *See*—
Bottger, Klaus; Muller, Dieter; Schmekel, Karl-W.; and Tausch, Walter, 4,234,252, Cl. 356-73.000.

Schmid, Hanns-Martin: *See*—
Wiedmann, Werner; and Schmid, Hanns-Martin, 4,234,259, Cl. 366-81.000.

Schmid, Max: *See*—
Barner, Richard; and Schmid, Max, 4,234,490, Cl. 260-340.90R.

Schmidt, Erich, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Stereo line scanner. 4,234,241, Cl. 350-6.900.

Schmidt, Manfred: *See*—
Patuzzi, Alexander; Riegler, Ernst; and Schmidt, Manfred, 4,234,171, Cl. 266-248.000.

Schmidt, Robert R.: *See*—
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,234,722, Cl. 544-58.400.

Schmitt, Frederick L.: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,234,463, Cl. 252-522.00R.

Schmitt, Susan M.: *See*—
Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., 4,234,596, Cl. 424-274.000.

Schmoock, James C., to Raytheon Company. Monostable multivibrator employing nonsaturating switching transistor. 4,234,806, Cl. 307-273.000.

Schneider, Manfred, to Veb Textima Wirkmaschinenbau Karl Marx Stadt. Warp knitting of double jacquard-patterned pile fabric. 4,233,824, Cl. 66-87.000.

Schneider, Peter: *See*—
Muller, Beat; Schneider, Peter; Peter, Heinrich; and Bickel, Hans, 4,234,578, Cl. 424-246.000.

Schnell, William J., to Baxter Travenol Laboratories, Inc. Dual membrane mass transfer device. 4,234,428, Cl. 210-321.00B.

Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Hamer, David E.; and Paaren, Herbert E., 4,234,495, Cl. 260-397.200.

Schoeneweis, E. Frederick: *See*—
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Schoerner, Roger J.: *See*—
Chia, Enrique C.; and Schoerner, Roger J., 4,234,359, Cl. 148-2.000.

Scholl, Walter: *See*—
Mennicke, Winfried; Scholl, Walter; and Schundehutte, Karl-Heinz, 4,234,479, Cl. 260-145.00B.

Schomacher, Paul H. Device for closing severed body vessels. 4,233,981, Cl. 128-334.00R.

Schonherr, Erich: *See*—
Rabenau, Albrecht; von Alpen, Ulrich; Schonherr, Erich; and Muller, Gertraude, 4,234,554, Cl. 423-409.000.

Schonmeier, Herbert: *See*—
Meyer, Rolf; and Schonmeier, Herbert, 4,233,869, Cl. 83-500.000.

Schotte, Dietwald: *See*—
Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, 4,234,836, Cl. 318-480.000.

Schrader, Gerhard: *See*—
Hendrischk, Wolfgang; Nolte, Gerhard; and Schrader, Gerhard, 4,234,261, Cl. 400-621.000.

Schreiner, Kenneth E., to International Business Machines Corporation. Means for maintaining the identification of defective minor loops in a magnetic bubble memory. 4,234,935, Cl. 365-15.000.

Schroder, Rolf: *See*—
Maurer, Fritz; Schroder, Rolf; Hammann, Ingeborg; Homeyer, Bernhard; and Frohberger, Paul-Ernst, 4,234,587, Cl. 424-251.000.

Schroeder, Hobe; and Palmer, David A., to Standard Oil Company (Indiana). Formation, purification and recovery of phthalic anhydride. 4,234,494, Cl. 260-346.700.

Schroeder, Wolfgang: *See*—
Toussaint, Herbert; Schroeder, Wolfgang; and Franzischka, Wolfgang, 4,234,727, Cl. 544-178.000.

Schuette, Henry W.; and Wellons, Charles L., to Wellons, Inc. Pressurized waste wood furnace system. 4,233,914, Cl. 110-233.000.

Schuierer, Manfred, to Bruckner Apparatebau GmbH. Processes for removing impurities from textile materials. 4,234,311, Cl. 8-138.000.

Schultz, John, Jr.: *See*—
Borom, Marcus P.; and Schultz, John, Jr., 4,234,786, Cl. 219-544.000.

Schulz, Johann G.; Onopchenko, Anatoli; and Sabourin, Edward T., to GR & DC. Isomeric diaminobenzophenonedicarboxylic acids and method for preparing same. 4,234,743, Cl. 562-457.000.

Schulze, Eckehart, to Hartman & Lammle GmbH & Co. KG, Firma. Hydraulic shock absorption in punch or cutting presses. 4,233,872, Cl. 83-617.000.

Schumacher, Friedrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Railway car hydraulically dampened traction rods. 4,233,910, Cl. 105-182.00R.

Schumacher, Heinz; and Zacharias, Hermann, to Draloric Electronic GmbH. Piezoelectric filter and process for the manufacture thereof. 4,234,860, Cl. 333-187.000.

Schundehutte, Karl-Heinz: *See*—
Mennicke, Winfried; Scholl, Walter; and Schundehutte, Karl-Heinz, 4,234,479, Cl. 260-145.00B.

Schupback, Jesse L., to Deere & Company. Hose support bracket for backhoe swing frame. 4,234,012, Cl. 137-899.100.

Schussler, Mortimer: *See*—
Ghandehari, Mohammad H.; and Schussler, Mortimer, 4,234,333, Cl. 75-0.5BA.

Schwartz, Joseph: *See*—
Krapcho, John; and Schwartz, Joseph, 4,234,602, Cl. 424-330.000.

Schwarz, Karl E. Automatic bagging machine. 4,233,797, Cl. 53-66.000.

Schwarz, Walter. Method of making a pipe coupling. 4,234,368, Cl. 156-91.000.

Schweitzer, Edmund O. Fault indicator. 4,234,847, Cl. 324-146.000.

Schwieter, Ulrich: *See*—
Chodnekar, Madhukar S.; Loeliger, Peter; Schwieter, Ulrich; Pfiffner, Albert; Suchy, Milos; and Zurflun, Rene, 4,234,598, Cl. 424-278.000.

Scientific Applications Incorporated: *See*—
Titone, Joseph R.; Brissey, David C.; and Carlson, Denny L., 4,234,007, Cl. 137-101.190.

SCM Corporation: *See*—
Gawrilow, Ilija, 4,234,606, Cl. 426-24.000.
Jasko, James J.; and Zielinski, Richard J., 4,234,618, Cl. 426-607.000.

Scodino, Ambrogio, to Saipem, S.p.A. Apparatus for recovering, by means of a pipelaying craft, pipes laid on deep sea beds. 4,234,268, Cl. 405-158.000.

Scott, John W.: *See*—
Berger, Leo; and Scott, John W., 4,234,487, Cl. 260-315.000.

Scott Paper Company: *See*—
Colby, Donald B., 4,234,226, Cl. 297-21.000.

Scott, Richard L., to Phillips Petroleum Company. Gas chromatographic analysis method and apparatus. 4,234,315, Cl. 23-230.0PC.

Scott, Robert N.; Gavin, David F.; and Milnes, Frank J., to Olin Corporation. Silicone oil compositions containing silicate cluster compounds. 4,234,441, Cl. 252-78.300.

Scrutton, Simon L.; Shepherd, John V.; Thornley, John S.; and Sutton, Eric M., to Letraset Corporation. Manufacture of signs using photoimaging and heat transfer. 4,234,673, Cl. 430-252.000.

Seader, Junior D., to University of Utah. Continuous distillation apparatus and method. 4,234,391, Cl. 203-26.000.

Sealand Service Inc.: *See*—
Wallace, Clifford G.; von Isenburg, Carl; Chun, Michael D.; Holmberg, Kenneth G.; and Bryant, Robert T., 4,234,926, Cl. 364-551.000.

Sebestyen, Gyula: *See*—
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.

Secim: *See*—
Houdion, Pierre, 4,233,830, Cl. 72-38.000.

Sedlaczek, Janusz; Blazewicz, Andrzej; Cyrulo, Jacek; Krutki, Marian; and Wozniak, Tadeusz, to Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych Komag. Driving device for a mining machine. 4,234,234, Cl. 299-43.000.

Seeger, Bernd: *See*—
Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, 4,234,808, Cl. 310-49.00R.

Seeholzer, Josef: *See*—
Michaud, Horst; Rieder, Georg; and Seeholzer, Josef, 4,234,332, Cl. 71-30.000.

Seiler, Claus-Dietrich: *See*—
Kappler, Fritz-Robert; and Seiler, Claus-Dietrich, 4,234,502, Cl. 556-413.000.
Kappler, Fritz-Robert; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,234,503, Cl. 556-413.000.

Seiler, Karl H., to Krauss-Maffei Aktiengesellschaft. Linear induction motor with improved rail assembly. 4,233,906, Cl. 104-294.000.

Seiler, Kurt: *See*—
Kuhn, Helmut; and Seiler, Kurt, 4,234,651, Cl. 428-290.000.

Seiz, Carl G.: *See*—
Seiz, Frederick G.; and Seiz, Carl G., 4,234,069, Cl. 193-35.00A.

Seiz, Frederick G.; and Seiz, Carl G., to Variable Control Systems, Inc. Vehicle speed control apparatus. 4,234,069, Cl. 193-35.00A.

Sekiguchi, Kouichi; Takematsu, Hikaru; and Katsukura, Kazutada, to Iwasaki Tsushinki Kabushiki Kaisha. Key telephone system. 4,234,765, Cl. 179-99.00M.

Sekiguchi, Tsunetoshi: *See*—
Maekawa, Yasuo; Sekiguchi, Tsunetoshi; Waki, Masahiko; Koide, Hiroshi; Watanabe, Kisuke; Matsumura, Osamu; and Yamagata, Hisao, 4,234,948, Cl. 368-291.000.

Sellers, Wm. Ralph. Dental twist lock pin and wrench. 4,234,309, Cl. 433-225.000.

Seltzer, Steven F.: *See—*
Pulley, Howard; and Seltzer, Steven F., 4,234,555, Cl. 423-484.000.

Sener Ingenieria y Sistemas, S.A.: *See—*
Torroja, Jaime M.; Rivacoba, Jose U.; and Herrero, Ricardo M., 4,233,921, Cl. 114-74.00R.

Sensotherm AB: *See—*
Almen, Rune, 4,234,039, Cl. 165-67.000.

Serboli, Giancarlo: *See—*
Vanoni, Pier L.; Serboli, Giancarlo; and De Marchi, Franco, 4,234,652, Cl. 428-296.000.

Service d'Exploitation Industrielle des Tabacs: *See—*
Sass, Bernard J., 4,233,994, Cl. 131-58.000.

Sesamat Anstalt: *See—*
Riedel, Tilo, 4,234,027, Cl. 152-213.00R.

Seven-H Corporation: *See—*
Hart, Edwin R., 4,234,614, Cl. 426-462.000.

Sewell, Richard B. H.; and Kidd, Derek J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Microporous protective coverings. 4,234,637, Cl. 428-131.000.

Seynaeve, Jan: *See—*
De Meyer, Herman; Doclo, Roland; and Seynaeve, Jan, 4,234,322, Cl. 55-18.000.

Shabtai, Yossef: *See—*
Gutnick, David L.; Rosenberg, Eugene; and Shabtai, Yossef, 4,234,689, Cl. 435-101.000.

Shargorodsky, Valentina: *See—*
Perakh, Mark; Ginsburg, Hana; Salomon, Erna; Shargorodsky, Valentina; and Rubinstein, Liuba, 4,234,396, Cl. 204-51.000.

Sharon Manufacturing Company: *See—*
Hudson, Sharon J., Jr., 4,234,328, Cl. 55-447.000.

Sharp Kabushiki Kaisha: *See—*
Kako, Noritoshi; Yamane, Yasukuni; and Suzuki, Chuji, 4,234,821, Cl. 315-169.300.

Sharp, Richard S.: *See—*
Chu, Ke-Chiang; and Sharp, Richard S., 4,234,918, Cl. 364-200.000.

Shaw, Richard G.: *See—*
Amembal, Amar; Bostwick, Robert; and Shaw, Richard G., 4,234,656, Cl. 428-379.000.

Shaw, Seth T., Jr. IUD Arrangement. 4,233,968, Cl. 128-130.000.

Shearon, Lawrence W.: *See—*
Hartlaub, Jerome T.; McDonald, Ray S.; and Shearon, Lawrence W., 4,233,985, Cl. 128-419.0PG.

Shelby, Billy L.: *See—*
Barnes, Jocelyn T.; Hard, Chester A., III; Shelby, Billy L.; and Loch, Charles H., 4,234,912, Cl. 362-145.000.

Shell Oil Company: *See—*
Boersma, Michael A. M.; and Sie, Swan T., 4,234,412, Cl. 208-80.000.
Titus, Paul E., 4,234,629, Cl. 427-388.200.
Van Berkel, Johannes; and Kelderman, Hendrik C., 4,234,512, Cl. 568-420.000.
van der Zeeuw, Abraham J.; Koenders, Peter; and Kok, Riekert, 4,234,546, Cl. 423-139.000.
Verschuur, Eke, 4,234,320, Cl. 44-23.000.
Viramontes, Jose A., 4,234,105, Cl. 222-233.000.

Shepard, Inella G.: *See—*
Graham, William H.; and Shepard, Inella G., 4,234,738, Cl. 560-32.000.

Shepherd, John V.: *See—*
Scrutton, Simon L.; Shepherd, John V.; Thornley, John S.; and Sutton, Eric M., 4,234,673, Cl. 430-252.000.

Sherif, Fawzy G.: *See—*
Benkwitt, Frances C.; and Sherif, Fawzy G., 4,234,568, Cl. 424-54.000.

Sherman, Richard H.: *See—*
Gable, Melvin G.; and Sherman, Richard H., 4,234,952, Cl. 370-94.000.

Shibata, Norio, to Victor Company of Japan Ltd. Apparatuses for reproducing signals from rotary recording mediums. 4,234,195, Cl. 274-39.00R.

Shibuya, Yoshikazu: *See—*
Fujiwara, Yukio; Yamaji, Shigeru; Shibuya, Yoshikazu; and Nitta, Tohei, 4,234,902, Cl. 361-120.000.

Shigehara, Katsumi. Transformer framing structure. 4,234,865, Cl. 336-92.000.

Shima, Eiji; Shimizu, Masao; and Den, Hiroshi, to FEBS International, Ltd.; and Fujikura Cable Works, The. Flat type cable suspension structure. 4,234,146, Cl. 248-63.000.

Shimizu, Masao: *See—*
Shima, Eiji; Shimizu, Masao; and Den, Hiroshi, 4,234,146, Cl. 248-63.000.

Shimizu, Shigehisa; Fukuhara, Sanshiro; Shinmura, Noboru; and Tanigawa, Hisahiro, to Fuji Photo Film Co., Ltd. Web butt-joining system. 4,234,365, Cl. 156-64.000.

Shinmura, Noboru: *See—*
Shimizu, Shigehisa; Fukuhara, Sanshiro; Shinmura, Noboru; and Tanigawa, Hisahiro, 4,234,365, Cl. 156-64.000.

Shinohara, Toshio: *See—*
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,234,023, Cl. 141-99.000.

Shiseki, Yutaka, to Ozen Corporation. Simplified phonograph capable of selecting desired grooves on a record disc. 4,234,193, Cl. 274-1.00A.

Shoop, Vernon A.: *See—*
Mazzoni, Renato J.; and Shoop, Vernon A., 4,233,796, Cl. 52-789.000.

Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with mixtures of 2,5-dialkyl dihydrofuranones and 2,4,5-trialkyl dihydrofuranones. 4,234,616, Cl. 426-536.000.

Shukla, Vishnu S. Apparatus for administering intravenous drugs. 4,233,973, Cl. 128-214.00R.

Shumate, Michael S.: *See—*
United States of America, National Aeronautics and Space Administration; Margolis, Jack S.; and Shumate, Michael S., 4,234,258, Cl. 356-437.000.

Shumway, DeWayne J.; and Gennetten, Delbert D., to Dixson, Inc. Inductive pickup clip. 4,234,863, Cl. 336-90.000.

Sibley, Henry C., to General Signal Corporation. Vital electronic code generator. 4,234,870, Cl. 340-348.000.

Sie, Inc.: *See—*
Boop, Gene T., 4,234,768, Cl. 200-52.00R.

Sie, Swan T.: *See—*
Boersma, Michael A. M.; and Sie, Swan T., 4,234,412, Cl. 208-80.000.

Sieben, Joannus H. F. C.: *See—*
Van Nie, Cornelis P.; Werner, Franz; Maryschka, Gerhard; and Sieben, Joannus H. F. C., 4,234,140, Cl. 242-199.000.

Siedenstrang, Roy W.: *See—*
Thorsrud, Agmund K.; and Siedenstrang, Roy W., 4,234,636, Cl. 428-95.000.

Siegal, Burton L. Power seat memory. 4,234,936, Cl. 365-244.000.

Siemens Aktiengesellschaft: *See—*
Amtmann, Heribert, 4,234,793, Cl. 250-414.000.
Dreisbach, Bodo; and Eidling, Karl, 4,234,254, Cl. 356-244.000.
Klemm, Richard, 4,234,880, Cl. 343-5.0FT.
Maringer, Albert, 4,234,846, Cl. 324-117.00H.
Naser, Georg, 4,233,979, Cl. 128-303.00R.
Pfeifer, Rolf, 4,234,928, Cl. 364-571.000.

Sigmund, Jerry A., to SPS Technologies, Inc. Grooved fastener. 4,233,879, Cl. 85-7.000.

Simmons, Walter J., to University of Delaware. Ocean thermal engine. 4,233,813, Cl. 60-496.000.

Simons, Craig W., to Amerace Corporation. Adaptor for paper-insulated, lead-jacketed electrical cables. 4,234,755, Cl. 174-19.000.

Simons, Craig W., to Amerace Corporation. Electrical cable accessories configured for lubricated installation. 4,234,757, Cl. 174-73.00R.

Simpson, Jeremy F.: *See—*
Lower, William E.; Mitchell, Stephen C.; and Simpson, Jeremy F., 4,234,416, Cl. 209-247.000.

Singer Company, The: *See—*
Beck, James C.; and Nielsen, Harrie W., 4,234,891, Cl. 358-104.000.
Boniface, John A.; Field, Ronald E.; Gwynn, Eric C.; and Turner, William L. A., 4,233,755, Cl. 35-11.00R.
Peters, David L., 4,234,893, Cl. 358-180.000.

Singh, Amar J., to NCR Corporation. Optical coupler module in a distributed processing system. 4,234,968, Cl. 455-607.000.

Singh, Amar J., to NCR Corporation. Bidirectional optical coupler for a data processing system. 4,234,969, Cl. 455-607.000.

Sinsley, John D. Rest rooms. 4,233,692, Cl. 4-662.000.

Sirrenberg, Wilhelm; Hammann, Ingeborg; Stendel, Wilhelm; and Klauke, Erich, to Bayer Aktiengesellschaft. Combating arthropods with N-benzoyl-N'-tert.-alkoxycarbonylphenyl-(thio) ureas. 4,234,600, Cl. 424-310.000.

Sitek, George J.: *See—*
Bredeweg, Roger L.; and Sitek, George J., 4,234,541, Cl. 422-78.000.

Sitton, Robert L.: *See—*
Miller, Walter E., Jr.; Duke, Jimmy R.; Starkey, George W.; and Sitton, Robert L., 4,234,141, Cl. 244-3.130.

Skees, Hugh B., to Standard Register Company, The. Carbonless record system. 4,234,213, Cl. 282-27.500.

Skega Aktiebolag: *See—*
Hurst, George P.; and Svensson, Assar N., 4,234,291, Cl. 415-174.000.

SKF Kugellagerfabriken GmbH: *See—*
Diem, Rudolf; and Hentrich, Hans-Jurgen, 4,234,848, Cl. 324-262.000.
Olschewski, Armin; Kunkel, Heinrich; Brandenstein, Manfred; and Walter, Lothar, 4,233,855, Cl. 74-396.000.

SKW Trostberg Aktiengesellschaft: *See—*
Michaud, Horst; Rieder, Georg; and Seeholzer, Josef, 4,234,332, Cl. 71-30.000.

Skyline Industries, Inc.: *See—*
Airhart, Tom P., 4,234,190, Cl. 273-420.000.

Slobodchikov, Vladimir B.: *See—*
Piterskikh, Georgy P.; Sukhov, Stanislav A.; Slobodchikov, Vladimir B.; and Rybalchenko, Gleb F., 4,234,525, Cl. 261-89.000.

Slocum, Keith: *See—*
Hartley, Frederick; Slocum, Keith; Newquist, John; and Moga, Nicholas, 4,233,902, Cl. 102-41.000.

Small, James E., to Emhart Industries, Inc. Control system utilizing momentary switching devices. 4,234,801, Cl. 307-38.000.

Small, Stuart R., to Colonial Spring Company, The. Device for hanging a picture frame. 4,233,764, Cl. 40-152.100.

Smernoff, Ronald B.: *See—*
Lucas, Flordeliza F.; and Smernoff, Ronald B., 4,234,317, Cl. 23-230.00B.

Smith, Clay D.; and Keller, Douglas V., Jr., to Standard Oil Company. Methods of and apparatus for mining and processing tar sands and the like. 4,234,232, Cl. 299-5.000.
Smith, David W.; and Paar, Mark W., to Townsend Engineering Company. Link cutter. 4,233,709, Cl. 17-1.00F.
Smith, James C.: *See—*
Martin, Gary G.; and Smith, James C., 4,234,198, Cl. 277-145.000.
Smith Kline & French Laboratories Limited: *See—*
Brown, Thomas H.; and Ife, Robert J., 4,234,588, Cl. 424-251.000.
Smith, Robert W.: *See—*
Gowetski, Michael; and Smith, Robert W., 4,234,633, Cl. 428-36.000.
Smith, William E.: *See—*
Hallgren, John E.; and Smith, William E., 4,234,504, Cl. 260-463.000.
Smith, Willis M.: *See—*
DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., 4,234,622, Cl. 427-45.100.
Snyder, Clinton D.: *See—*
Rapoport, Henry; and Snyder, Clinton D., 4,234,746, Cl. 568-633.000.
Snyder, Richard C.; and Bodinger, Donald C., to Pullman Incorporated. Field repair roof panel for a railway car. 4,233,795, Cl. 52-514.000.
Sobajima, Shigenobu: *See—*
Yatabe, Toshiaki; Sobajima, Shigenobu; and Sugiyama, Ikuto, 4,234,654, Cl. 428-333.000.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Busacca, Guido; Luparello, Pietro; Marranca, Lucio; and Sanfilippo, Michele, 4,234,855, Cl. 331-90.000.
Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Paoletti, Ugo; and Volterra, Alessandro, 4,234,312, Cl. 8-151.200.
Societe Anonyme Automobiles Citroen: *See—*
Thiesce, Pierre, 4,234,205, Cl. 280-723.000.
Societe Anonyme Expandet: *See—*
Caille, Gilles, 4,233,799, Cl. 53-154.000.
Societe Anonyme Francaise du Ferodo: *See—*
Billet, Rene, 4,234,067, Cl. 192-98.000.
Le Brise, Raymond, 4,234,068, Cl. 192-106.200.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Hersom, Albert C.; Brittain, John E.; and Darlington, Raymond, 4,234,537, Cl. 422-26.000.
Societe d'Investissement pour le Developpement des Appareils Menagers: *See—*
Neny, Michel, 4,233,962, Cl. 126-450.000.
Societe Industrielle de Liaisons Electriques-Silec: *See—*
Jocteur, Robert, 4,234,531, Cl. 264-174.000.
Societe Nationale Elf Aquitaine (Production): *See—*
Favie, Claude, 4,234,692, Cl. 521-33.000.
Societe pour l'Equipement de Vehicules: *See—*
Poirier d'Ange d'Orsay, Emmanuel J., 4,233,949, Cl. 123-634.000.
Soda, Kenji: *See—*
Kusakabe, Hitoshi; Kodama, Kenjiro; Midorikawa, Yuichiro; Kuninaka, Akira; Misono, Haruo; and Soda, Kenji, 4,234,691, Cl. 435-191.000.
Soderberg, Mark S.: *See—*
Benson, Richard L.; Hill, Horace E.; and Soderberg, Mark S., 4,234,277, Cl. 408-226.000.
Soderqvist, Gunnar M. T.; and Aberg, Ulf L., to Rockwool Aktiebolaget. Method for the production of mineral fibers with unitary fiber length characteristics. 4,234,329, Cl. 65-2.000.
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, to Olympus Optical Co., Ltd. Liquid feeder for automatic culture apparatus. 4,234,023, Cl. 141-99.000.
Sokol, Phillip E., to Gillette Company, The. Reacting protein with organic acid. 4,234,475, Cl. 260-112.00R.
Solvay & Cie.: *See—*
Cuypers, Herve; and Baekelmans, Paul, 4,234,716, Cl. 528-483.000.
Somerville Belkin Industries Limited: *See—*
Atkinson, William G., 4,234,635, Cl. 428-80.000.
Sommer, Rudiger; and Wischer, Hermann, to Dr. Ing. Rudolf Hell GmbH. Converting a video signal into a two-level signal. 4,234,895, Cl. 358-282.000.
Soneoka, Ryusuke: *See—*
Kinoshita, Tsuneo; Sato, Kazuyuki; and Soneoka, Ryusuke, 4,234,921, Cl. 364-424.000.
Sony Corporation: *See—*
Hongu, Masayuki; Kawakami, Hiromi; and Tokuhara, Masaharu, 4,234,963, Cl. 455-204.000.
Sorensen, Irvin. Chuck for miniature rotary tool. 4,234,201, Cl. 279-77.000.
Sorma S.n.c. di Pieri-Lotti & C.: *See—*
Lotti, Nevio, 4,234,279, Cl. 414-33.000.
Southwire Company: *See—*
Chia, Enrique C.; and Schoerner, Roger J., 4,234,359, Cl. 148-2.000.
Spann, Donald C. Ventilated body positioner. 4,233,700, Cl. 5-431.000.
Spanset Inter AG: *See—*
Cederblad, Claes A., 4,234,166, Cl. 24-68.0CD.
Spar Aerospace Limited: *See—*
Mee, Francis H. A.; and Taylor, Henry J., 4,234,150, Cl. 248-281.100.
Spashett, Michael C.: *See—*
Forrest, Stanley G.; and Spashett, Michael C., 4,234,186, Cl. 273-243.000.
Spencer, Barry A.: *See—*
Robbins, Richard J.; and Spencer, Barry A., 4,234,235, Cl. 299-56.000.
Sperry Corporation: *See—*
Jung, Check K.; and Whalen, Harold E., 4,234,856, Cl. 331-94.50P.
Vansteelant, Marc G., 4,234,219, Cl. 289-2.000.
Sperry Rand Corporation: *See—*
Thorsrud, Lee T., 4,234,934, Cl. 364-900.000.
Spielhoff, Horst, to Hermann Berstorff Maschinenbau GmbH. Apparatus for removing a cylinder from a screw extruder. 4,234,298, Cl. 425-186.000.
Spiesberger, August: *See—*
Geppert, Klaus; Heine, Gunter; Hubner, Karl; Ose, Gunter; Seeger, Bernd; Schaffer, Claus; and Spiesberger, August, 4,234,808, Cl. 310-49.00R.
Spilsbury, Ashton J.: *See—*
Spilsbury, Ronald W.; and Spilsbury, Ashton J., 4,234,960, Cl. 455-123.000.
Spilsbury, Ashton James: *See—*
Spilsbury, Ronald W.; and Spilsbury, Ashton J., 4,234,960, Cl. 455-123.000.
Spilsbury, Ronald W.; and Spilsbury, Ashton J., to Spilsbury, Ashton James. Antenna automatic tuning apparatus. 4,234,960, Cl. 455-123.000.
Spitler, Keith G.: *See—*
Phillips, Barry A.; Spitler, Keith G.; and Keegan, Richard E., 4,234,745, Cl. 568-614.000.
Spodig, Heinrich. Magnetic roller conveyor. 4,234,076, Cl. 198-690.000.
Spohr, Albert R.: *See—*
Gallanis, George P.; Spohr, Albert R.; and Lube, Robert R., 4,233,733, Cl. 30-43.920.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Cyclohexene methanol derivatives in perfume. 4,234,463, Cl. 252-522.00R.
SPS Technologies, Inc.: *See—*
Sigmund, Jerry A., 4,233,879, Cl. 85-7.000.
Spurgeon, Peter J. C., to AMF Incorporated. Apparatus for measuring and dispensing constant weight portions of material. 4,234,102, Cl. 222-55.000.
Stadler, Peter: *See—*
Petersen, Uwe; Voss, Eckart; Metzger, Karl G.; and Stadler, Peter, 4,234,572, Cl. 424-180.000.
Stamires, Dennis: *See—*
Alafandi, Hamid; and Stamires, Dennis, 4,234,457, Cl. 252-438.000.
Standard Lubricants, Inc.: *See—*
Honig, Milton L., 4,234,497, Cl. 260-410.600.
Standard Oil Company: *See—*
Schieman, Richard D.; and Steffens, John H., 4,234,409, Cl. 208-28.000.
Smith, Clay D.; and Keller, Douglas V., Jr., 4,234,232, Cl. 299-5.000.
Wu, Hsin C., 4,234,510, Cl. 260-465.300.
Standard Oil Company (Indiana): *See—*
Kirkpatrick, John W.; and Mower, Lawrence N., 4,234,042, Cl. 166-261.000.
Schroeder, Hobe; and Palmer, David A., 4,234,494, Cl. 260-346.700.
Standard Oil Company (Ohio): *See—*
Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., 4,234,461, Cl. 252-462.000.
Standard Register Company, The: *See—*
Skees, Hugh B., 4,234,213, Cl. 282-27.500.
Stanford University: *See—*
Swanson, Richard M., 4,234,352, Cl. 136-253.000.
Stanley Electric Co., Ltd.: *See—*
Teshima, Toru; Ariga, Kazuo; and Yoshida, Mitunari, 4,234,817, Cl. 313-493.000.
Stanley, Grahame L., to Courtaulds Limited. Stabilization of sulphur. 4,234,552, Cl. 423-268.000.
Stanley, Priscilla B.; and Ritscher, James S., to Union Carbide Corporation. Novel combustion process for an organic substrate. 4,234,549, Cl. 423-245.000.
Stanley Works, The: *See—*
Bies, Sylvester W., 4,233,734, Cl. 30-162.000.
Stark, Gerd, to Dyna Plastik-Werke GmbH. Roller blind box. 4,234,032, Cl. 160-261.000.
Stark, Hanoch, to Stark, Hanoch. Device particularly useful for cutting or grinding round girdles of gems. 4,233,783, Cl. 51-73.00R.
Stark, Wolfgang, to VDO Adolf Schindling AG. Monitoring device for the proper operation of lamps particularly in motor vehicles. 4,234,878, Cl. 340-642.000.
Starkey, George W.: *See—*
Miller, Walter E., Jr.; Duke, Jimmy R.; Starkey, George W.; and Sitton, Robert L., 4,234,141, Cl. 244-3.130.
Staroselsky, Alexandr A.: *See—*
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.
Statia de Verificare si Intretinere a Aparaturii Medicale: *See—*
Voinea, Vasile; Catuneanu, Vasile; Birzu, Ioan; Teisanu, Eugen; Voinea, Maria I.; and Patrascu, Sorin, 4,234,794, Cl. 250-416.0TV.

Stauers, Juris, to Motorola, Inc. Dynamic digital time interval discriminator and method. 4,234,881, Cl. 343-8.000.

Stauffer Chemical Company: *See—*
Benkwitt, Frances C.; and Sherif, Fawzy G., 4,234,568, Cl. 424-54.000.
DeBaun, Jack R.; Pallos, Ferenc M.; and Gutman, Arnold D., 4,234,593, Cl. 424-272.000.
Photis, James M., 4,234,505, Cl. 260-465.00D.
Photis, James M., 4,234,506, Cl. 260-465.00D.
Photis, James M., 4,234,507, Cl. 260-465.00D.
Photis, James M., 4,234,508, Cl. 260-465.00D.
Photis, James M., 4,234,737, Cl. 549-70.000.
Photis, James M.; Eiseman, Fred S.; and Gister, Sidney M., 4,234,739, Cl. 560-51.000.

Steag Kernenergie GmbH: *See—*
Baatz, Henning; and Rittscher, Dieter, 4,234,798, Cl. 250-506.000.

Steel, William G.: *See—*
Clyne, John C.; Steel, William G.; and Nicholls, Ronald T., 4,233,703, Cl. 15-53.00B.

Steffens, John H.: *See—*
Schieman, Richard D.; and Steffens, John H., 4,234,409, Cl. 208-28.000.

Steiner, Russell I., to Crompton & Knowles Corporation. Yellow pyrazolone ester dyes for heat transfer printing. 4,234,481, Cl. 260-163.000.

Stelzer, Robert A.: *See—*
Fischer, Thomas R.; and Stelzer, Robert A., 4,233,804, Cl. 56-104.000.

Stemer, Jacques: *See—*
Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, 4,234,721, Cl. 544-30.000.

Stendel, Wilhelm: *See—*
Sirrenberg, Wilhelm; Hammann, Ingeborg; Stendel, Wilhelm; and Klauke, Erich, 4,234,600, Cl. 424-310.000.

Stephens, Donald J. Game device. 4,234,183, Cl. 273-318.000.

Stephens, James B.: *See—*
Miller, Charles G.; and Stephens, James B., 4,234,098, Cl. 220-86.00R.

Sterling Drug Inc.: *See—*
Diana, Guy D.; and Carabateas, Philip M., 4,234,725, Cl. 544-140.000.
Wilhelmi, Allan R.; and Troy, Daniel C., 4,234,426, Cl. 210-149.000.

Stern, Sidney S.: *See—*
Yeoman, Neil; and Stern, Sidney S., 4,234,519, Cl. 568-492.000.

Steube, Kenneth E., to McDonnell Douglas Corporation. Vapor deposition coating machine. 4,233,937, Cl. 118-727.000.

Stewart-Warner Corporation: *See—*
Boesen, Raymond J., 4,234,914, Cl. 362-240.000.

Stiebel, Ariel, to Uniroyal, Inc. Load control for tire test machine. 4,233,838, Cl. 73-146.000.

Stiot, Jean-Pierre H.: *See—*
Brouard, Claude M. H. E.; and Stiot, Jean-Pierre H., 4,234,482, Cl. 260-187.000.

Stirling, Harold T. Continuous coke making. 4,234,386, Cl. 201-6.000.

Stocklow, Peter. Height-adjustable wash-basin. 4,233,693, Cl. 4-644.000.

Stoddard, Frank J., to Calspan Corporation. Centrifugal gasdynamic window. 4,234,857, Cl. 331-94.50G.

Stohler, Harro: *See—*
Bernauer, Karl; Link, Helmut; and Stohler, Harro, 4,234,736, Cl. 548-314.000.

Stokes, Vijay K., to General Electric Company. Unsymmetrical basket for an orbital clothes washer. 4,233,827, Cl. 68-172.000.

Stoll, Kurt. Piston-cylinder unit. 4,233,887, Cl. 92-169.000.

Stottmann, Richard L., to General Electric Company. Automatic icemaker with simplified ice piece ejection. 4,233,819, Cl. 62-349.000.

Strebkov, Dmitry S.: *See—*
Lidorenko, Nikolai S.; Litsenko, Tatyana A.; Potapov, Valery N.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S., 4,234,354, Cl. 136-246.000.

Strickland, William A., Jr., to Westinghouse Electric Corp. Protective relay apparatus. 4,234,901, Cl. 361-64.000.

Strobl, Frederick P., Jr.; Winchell, David A.; and DeVroom, William A., to Baxter Travenol Laboratories, Inc. Diagnostic reagent dispensing bottle. 4,234,103, Cl. 222-83.500.

Strope, Daniel J., to Phillips Petroleum Company. Diolefin dimerization catalyst and method for producing nitrosyl halides of iron triad metals. 4,234,454, Cl. 252-429.00R.

Stuhler, Herbert: *See—*
Billenstein, Siegfried; Kukla, Bruno; and Stuhler, Herbert, 4,234,509, Cl. 260-465.200.

Suchy, Milos: *See—*
Chodnekar, Madhukar S.; Loeliger, Peter; Schwieter, Ulrich; Pfiffner, Albert; Suchy, Milos; and Zurflun, Rene, 4,234,598, Cl. 424-278.000.

Sugi, Norio: *See—*
Ohta, Yuzo; Sugi, Norio; Isogai, Osamu; Hirai, Takahiro; and Kaji, Hidehiko, 4,234,469, Cl. 260-42.460.

Sugisawa, Ko: *See—*
Sakakibara, Sakuichi; Sugisawa, Ko; Majima, Junji; and Nakanaga, Ryusuke, 4,234,612, Cl. 426-394.000.
Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; Yasukawa, Teruo; and Kamoda, Tamotsu, 4,234,617, Cl. 426-557.000.

Sugiura, Isao: *See—*
Yamazoe, Hiroshi; and Sugiura, Isao, 4,234,638, Cl. 428-133.000.

Sugiyama, Ikuto: *See—*
Yatabe, Toshiaki; Sobajima, Shigenobu; and Sugiyama, Ikuto, 4,234,654, Cl. 428-333.000.

Suitlas, John R., to National Steel Corporation. Movable charging emissions control hood for BOF. 4,234,170, Cl. 266-158.000.

Sukhov, Stanislav A.: *See—*
Piterskikh, Georgy P.; Sukhov, Stanislav A.; Slobodchikov, Vladimir B.; and Rybalchenko, Gleb F., 4,234,525, Cl. 261-89.000.

Sulzer Brothers Limited: *See—*
Mandrin, Charles, 4,234,553, Cl. 423-359.000.

Sumita, Tadayuki: *See—*
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,234,534, Cl. 264-328.800.

Sumitomo Electric Industries, Ltd.: *See—*
Okita, Koichi, 4,234,535, Cl. 264-519.000.
Yamamoto, Masachika, 4,234,058, Cl. 188-1.00A.

Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See—*
Sakamoto, Suguru; Nakazato, Takuzo; Minoshima, Tsugio; and Tanaka, Tohachiro, 4,234,217, Cl. 285-150.000.

Summers, Don D. Method and apparatus for self-cleaning drilling mud separation system. 4,234,413, Cl. 209-17.000.

Sun, Jui-Yuan: *See—*
Burk, Emmett H., Jr.; Yoo, Jin S.; Sun, Jui-Yuan; and Karch, John A., 4,234,452, Cl. 252-419.000.

Sunbeam Corporation: *See—*
Gallanis, George P.; Spohr, Albert R.; and Lube, Robert R., 4,233,733, Cl. 30-43.920.

Superior Oil Company, The: *See—*
Weichman, Bernard E., 4,234,230, Cl. 299-2.000.

Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., to Standard Oil Company (Ohio). Oxidation catalysts. 4,234,461, Cl. 252-462.000.

Sutton, Eric M.: *See—*
Scrutton, Simon L.; Shepherd, John V.; Thornley, John S.; and Sutton, Eric M., 4,234,673, Cl. 430-252.000.

Suzor, Norland L. C., to Davies Hamakua Sugar Co., a division of Theo. H. Davies, Ltd. Apparatus for the purification of evaporated sugar solutions. 4,234,349, Cl. 127-12.000.

Suzor, Norland L. C., to Davies Hamakua Sugar Co., a division of Theo. H. Davies, Ltd. Process for the purification of evaporated sugar solutions. 4,234,350, Cl. 127-48.000.

Suzuki, Chuji: *See—*
Kako, Noritoshi; Yamane, Yasukuni; and Suzuki, Chuji, 4,234,821, Cl. 315-169.300.

Suzuki, Kenichi, to Suzusei Co., Ltd. Artificial eye structure for use in a doll. 4,233,776, Cl. 46-165.000.

Suzuki, Nobuo: *See—*
Koyahata, Hirosi; and Suzuki, Nobuo, 4,234,194, Cl. 274-10.00R.

Suzuki, Yoshiaki; Nakakuki, Junichi; Mizukawa, Takumi; and Ogino, Yoshio, to Matsushita Electric Industrial Co., Ltd. Commutation failure detection and restoration for SCR frequency converters. 4,234,917, Cl. 363-160.000.

Suzuki, Yukio: *See—*
Uehara, Tsutomu; Oguchi, Toshihiko; Kubo, Tsutomu; and Suzuki, Yukio, 4,233,935, Cl. 118-657.000.

Suzusei Co., Ltd.: *See—*
Suzuki, Kenichi, 4,233,776, Cl. 46-165.000.

Svensson, Assar N.: *See—*
Hurst, George P.; and Svensson, Assar N., 4,234,291, Cl. 415-174.000.

Svoboda, Josef: *See—*
Hofbauer, Rupert; Leichtfried, Friedrich; and Svoboda, Josef, 4,234,206, Cl. 280-605.000.

Swanbeck, Gunnar P. E., to Medisan AB. Skin-treating composition and vehicle for skin-treating agents. 4,234,603, Cl. 424-365.000.

Swanson, Harold N.; and Pashalis, Cryssis, to FMC Corporation. Pipe swivel joint for submerged service. 4,234,216, Cl. 285-93.000.

Swanson, Richard M., to Electric Power Research Institute, Inc.; and Stanford University. Thermophotovoltaic converter and cell for use therein. 4,234,352, Cl. 136-253.000.

Sweeney, Michael T.: *See—*
Moore, William T.; and Sweeney, Michael T., 4,234,240, Cl. 350-6.100.

Swift & Company: *See—*
Murphy, Robert E.; and Bernholdt, Harry F., 4,234,647, Cl. 428-220.000.

Swiss Aluminium Ltd.: *See—*
Tschamper, Otto, 4,234,559, Cl. 423-629.000.

Syntex (U.S.A.) Inc.: *See—*
Cooper, Gary F.; and Van Horn, Albert R., 4,234,491, Cl. 260-340.9AS.
Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., 4,234,571, Cl. 424-177.000.

Szala, Lawrence E.: *See—*
Lee, Minyoung; Szala, Lawrence E.; and DeVries, Robert C., 4,234,661, Cl. 428-446.000.

Szayer, Geza J.: *See—*
Finch, Harry E.; and Szayer, Geza J., 4,234,220, Cl. 292-148.000.

Szucs, Tamas: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.

Tada, Sugihiko; Yanagihara, Kazuhiko; and Arakawa, Jun, to Fuji Photo Film Co., Ltd. Oil soluble photographic coupler reclamation process. 4,234,392, Cl. 203-91.000.

Tada, Tetsuya; and Amari, Masaharu, to Canyon Corporation. Manually operated sprayer. 4,234,127, Cl. 239-333.000.

Taguchi, Hideo: *See*—
Wakasa, Isao; Yamazaki, Shuichi; and Taguchi, Hideo, 4,234,342, Cl. 106-50.000.

Taisei Corporation: *See*—
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,234,534, Cl. 264-328.800.

Takagi, Yasuo: *See*—
Yoneda, Kenji; and Takagi, Yasuo, 4,233,836, Cl. 73-35.000.

Takahashi, George K. Appliance for use in acupressure therapy. 4,233,966, Cl. 128-67.000.

Takahashi, Hironobu; Honda, Masamitus; Murakami, Yasushi; and Iwane, Yoshitaka, to Chugai Seiyaku Kabushiki Kaisha. Trialkyl isocyanates used as pesticides. 4,234,582, Cl. 424-249.000.

Takahashi, Isamu: *See*—
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.

Takahashi, Kotaro, to Citizen Watch Co., Ltd. Electronic wristwatches. 4,234,946, Cl. 368-76.000.

Takahashi, Mitsuru; Omori, Yukio; Ikeda, Shuji; and Kataoka, Hiroyoshi, to Nippon Paint Co., Ltd. Process for preparation of solid pigment resin dispersion. 4,234,466, Cl. 260-17.00A.

Takahashi, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic shock absorber and spring combination. 4,234,172, Cl. 267-8.00R.

Takahashi, Tadashi; and Morinaga, Shigeki, to Hitachi, Ltd. Sewing machine protection apparatus. 4,233,919, Cl. 112-277.000.

Takahashi, Toshiyuki: *See*—
Adachi, Takeshi; Koike, Masahiko; and Takahashi, Toshiyuki, 4,233,875, Cl. 84-1.240.

Takano, Tatsuo: *See*—
Iwasaki, Susumu; Nagasawa, Osamu; Takano, Tatsuo; and Matsumoto, Seiji, 4,234,378, Cl. 162-138.000.

Takara Co., Ltd.: *See*—
Inoue, Tsutomu, 4,233,777, Cl. 46-238.000.
Otake, Michiko, 4,234,079, Cl. 206-45.340.

Takase, Hiroshi, to Olympus Optical Co., Ltd. Reducing lens system. 4,234,243, Cl. 350-226.000.

Take, Hisao, to Kabushiki Kaisha Kyoritsu Seisakujo. Ignition circuit for internal combustion engines. 4,233,951, Cl. 123-625.000.

Takehiro, Etsusou: *See*—
Toyota, Hiroshi; Kawamoto, Tamio; and Takehiro, Etsusou, 4,234,066, Cl. 192-0.092.

Takematsu, Hikaru: *See*—
Sekiguchi, Kouichi; Takematsu, Hikaru; and Katsukura, Kazutada, 4,234,765, Cl. 179-99.00M.

Takeno, Hidekazu: *See*—
Hashimoto, Masashi; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; and Hagiwara, Daijiro, 4,234,724, Cl. 544-90.000.

Takeshima, Masaki: *See*—
Kamiya, Kunio; Yusa, Hideo; Kitamura, Masao; Takeshima, Masaki; and Ishidate, Toshio, 4,234,456, Cl. 252-438.000.

Taketa, Mitsugu: *See*—
Miyazaki, Yukio; and Taketa, Mitsugu, 4,234,900, Cl. 361-45.000.

Takeuchi, Shigeo. Method of making bread in an oven using a combined trough and baking-pan unit. 4,234,605, Cl. 426-18.000.

Tamura, Tooru: *See*—
Ikushima, Hiroshi; Noguchi, Toyota; Danno, Tsuneo; and Tamura, Tooru, 4,234,859, Cl. 333-151.000.

Tanaka, Kunimaro: *See*—
Onishi, Ken; and Tanaka, Kunimaro, 4,234,896, Cl. 360-32.000.

Tanaka, Tohachiro: *See*—
Sakamoto, Suguru; Nakazato, Takuzo; Minoshima, Tsugio; and Tanaka, Tohachiro, 4,234,217, Cl. 285-150.000.

Tanigawa, Hisahiro: *See*—
Shimizu, Shigehisa; Fukuhara, Sanshiro; Shinmura, Noboru; and Tanigawa, Hisahiro, 4,234,365, Cl. 156-64.000.

Tannenbaum, Joseph, to Agar Ginosar Electronics and Metal Products. Apparatus and method for controlling pain by transcutaneous electrical stimulation (TES). 4,233,986, Cl. 128-421.000.

Tarpley, William B., Jr., to Energy and Minerals Research Co. Powder dissemination composition. 4,234,432, Cl. 252-8.000.

Tarro, Richard E. Container with attached pull tab opening. 4,234,099, Cl. 220-269.000.

Tate & Lyle Limited: *See*—
Righelato, Renton C.; and Jarman, Trevor R., 4,234,688, Cl. 435-101.000.

Taupin, Pierre; Glineur, Michel; and Florean, Jean, to BFG Glassgroup. Process of making cellulated glass beads. 4,234,330, Cl. 65-21.000.

Tausch, Walter: *See*—
Bottger, Klaus; Muller, Dieter; Schmekel, Karl-W.; and Tausch, Walter, 4,234,252, Cl. 356-73.000.

Tawara, Ikuo: *See*—
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,234,023, Cl. 141-99.000.

Taylor, Edward L., III. Combination pack frame, cot, and tent. 4,234,005, Cl. 135-1.00R.

Taylor, Henry J.: *See*—
Mee, Francis H. A.; and Taylor, Henry J., 4,234,150, Cl. 248-281.100.

Taylor, Judson D., Jr.: *See*—
Barnard, Ralph G.; and Taylor, Judson D., Jr., 4,233,701, Cl. 5-482.000.

Taylor, Wilson G. Method and apparatus for measuring the imbalance of a bowling ball. 4,233,846, Cl. 73-460.000.

TDK Electronics Company Limited: *See*—
Horigome, Eiji; Ota, Hiroshi; and Azegami, Hitoshi, 4,234,438, Cl. 252-62.540.

Technical Developments, Inc.: *See*—
Wolfberg, Larry B.; and Harper, John, 4,234,775, Cl. 219-10.55A.

Tecumseh Products Company: *See*—
Krolski, Kenneth L.; and MacLeod, John N., 4,233,950, Cl. 123-630.000.

Teijin Limited: *See*—
Yatabe, Toshiaki; Sobajima, Shigenobu; and Sugiyama, Ikuto, 4,234,654, Cl. 428-333.000.

Teisanu, Eugen: *See*—
Voinea, Vasile; Catuneanu, Vasile; Birzu, Ioan; Teisanu, Eugen; Voinea, Maria I.; and Patrascu, Sorin, 4,234,794, Cl. 250-416.0TV.

Teldec Telefunken-Decca Schallplatten GmbH: *See*—
Borchard, Heinz, 4,234,394, Cl. 204-5.000.

Temple, Davis L., Jr., to Mead Johnson & Company. Thieno[2,3-d]oxazines. 4,234,581, Cl. 424-248.510.

Teramoto, Isao: *See*—
Harasaki, Hayatsugu; and Teramoto, Isao, 4,234,225, Cl. 296-185.000.

Teramoto, Kazuo; Watanabe, Minoru; and Matumura, Tetuo, to Citizen Watch Co., Ltd. Month correcting mechanism for calendar timepieces. 4,234,943, Cl. 368-35.000.

Terashima, Akio: *See*—
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.

Teshima, Toru; Ariga, Kazuo; and Yoshida, Mitunari, to Stanley Electric Co., Ltd. Flat type fluorescent lamp. 4,234,817, Cl. 313-493.000.

Texaco Canada Inc.: *See*—
Goss, Michael J.; and Redford, David A., 4,233,840, Cl. 73-153.000.

Texaco Development Corp.: *See*—
McConnell, Thomas T.; and Cour, Thomas H., 4,234,730, Cl. 544-358.000.

Texaco Inc.: *See*—
Mott, George E., 4,234,047, Cl. 175-5.000.

Texas Instruments Incorporated: *See*—
Raymond, Joseph H., Jr.; and Lien, Jih-Chang, 4,234,889, Cl. 357-71.000.
Wiggins, Richard H., Jr.; and Brantingham, George L., 4,234,761, Cl. 179-1.0SM.

Textron Inc.: *See*—
Earing, Mason H.; Gielinski, Leonard H.; Martin, Paul F.; and Petschke, Glenn H., 4,234,714, Cl. 528-67.000.

Th. Kieserling & Albrecht: *See*—
Hartkopf, Heinz, 4,234,288, Cl. 414-745.000.

Thackaberry, Harold L.: *See*—
Feldstein, Michael; and Thackaberry, Harold L., 4,234,899, Cl. 360-73.000.

Thagard Technology Company: *See*—
Matovich, Edwin, 4,234,543, Cl. 422-109.000.

Theiler, Robert. Ironing machine. 4,233,762, Cl. 38-8.000.

Thermatool Corp.: *See*—
Rudd, Wallace C.; and Udall, Humfrey N., 4,234,776, Cl. 219-76.170.

Thiel, Alfons W.; and Geppert, Barbara. Method for the manufacture of thin-walled shaped articles of crystalline thermoplastic material. 4,234,530, Cl. 264-151.000.

Thiel, Alfons W.; and Geppert, Barbara. Method for the manufacture of thin-walled shaped articles of crystalline thermoplastic material. 4,234,536, Cl. 264-522.000.

Thiesce, Pierre, to Societe Anonyme Automobiles Citroen; and Automobiles Peugeot. Suspension for independent vehicle wheels. 4,234,205, Cl. 280-723.000.

Thiokol Corporation: *See*—
Graham, William H.; and Shepard, Inella G., 4,234,738, Cl. 560-32.000.

Thomas, Louis N. Automatic curling iron. 4,233,999, Cl. 132-34.00R.

Thomas, Roland M., to Lucas Industries Limited. Tool for, and a method of, effecting a rotary turning operation. 4,233,866, Cl. 82-1.00C.

Thompson, David R.; and Tomlinson, John P., to Reed International Limited. Foam plastics sheet materials. 4,234,641, Cl. 428-159.000.

Thompson, Gregory J., to UOP Inc. Fluid catalytic cracking process. 4,234,411, Cl. 208-74.000.

Thompson, John H.; Gannon, George F., Jr.; and Geil, Fred G., to Electric Power Research Institute, Inc. Method and means for measuring temperature using acoustical resonators. 4,233,843, Cl. 73-339.00A.

Thompson, Lester L.: *See*—
Kuhl, LeRoy L.; and Thompson, Lester L., 4,233,791, Cl. 52-309.100.

Thompson, Lionel R. F., to Hawker Siddeley Dynamics Engr., Inc. Method and apparatus for measurement of the contents of a bunker or silo. 4,234,882, Cl. 343-14.000.

Thompson, Louis I.: *See*—
Brown, Joe B.; Thompson, Louis I.; and Mishanec, Stephen P., 4,233,907, Cl. 104-172.00B.

Thompson, Richard L.: *See*—
Murray, Omer E.; and Thompson, Richard L., 4,234,165, Cl. 248-404.000.
Thomsen, Eigild S.: *See*—
Gauld, W. Thomas; and Thomsen, Eigild S., 4,234,417, Cl. 209-306.000.
Thomson-CSF: *See*—
Butin, Henri, 4,234,867, Cl. 340-146.3AG.
Grall, Georges, 4,234,939, Cl. 367-87.000.
Thon, Stephen F.: *See*—
Grotefend, Alan C.; and Thon, Stephen F., 4,234,643, Cl. 428-200.000.
Thore, Bernard. Supercharged internal combustion engines. 4,233,814, Cl. 60-601.000.
Thorn Domestic Appliances (Electrical) Limited: *See*—
Totterdell, Anthony C., 4,234,784, Cl. 219-506.000.
Thornley, John S.: *See*—
Scrutton, Simon L.; Shepherd, John V.; Thornley, John S.; and Sutton, Eric M., 4,234,673, Cl. 430-252.000.
Thorsrud, Agmund K.; and Siedenstrang, Roy W., to Phillips Petroleum Company. Thermoplastic elastomeric composition, product and method of manufacture. 4,234,636, Cl. 428-95.000.
Thorsrud, Lee T., to Sperry Rand Corporation. Apparatus for scaling memory addresses. 4,234,934, Cl. 364-900.000.
Tibbals, Kerry W. Skateboard. 4,234,204, Cl. 280-87.04A.
Tichelaar, Gerrit W.: *See*—
Willems, Gerardus A. M.; and Tichelaar, Gerrit W., 4,234,778, Cl. 219-121.00P.
Tidland, John W.: *See*—
Hauff, Wolfgang; and Tidland, John W., 4,233,972, Cl. 128-205.120.
Timmons, William K.: *See*—
Gray, Dorian R.; Bishop, Richard N.; and Timmons, William K., 4,233,933, Cl. 118-314.000.
Tingskog, Karl A. L., to AB Siwertell. Apparatus for sealing a connection between two mutually shiftable components. 4,234,075, Cl. 199-594.000.
Tinsley, John M.; and Watters, Larry T., to Halliburton Company. Lightweight cement and method of cementing therewith. 4,234,344, Cl. 106-88.000.
Titone, Joseph R.; Brissey, David C.; and Carlson, Denny L., to Scientific Applications Incorporated. Automatic liquid flow control device. 4,234,007, Cl. 137-101.190.
Titus, Paul E., to Shell Oil Company. Method for improving the removal of oil from surfaces. 4,234,629, Cl. 427-388.200.
Tkachenko, Vladimir P.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boiko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,234,659, Cl. 428-403.000.
TMC Corporation: *See*—
Hofbauer, Rupert; Leichtfried, Friedrich; and Svoboda, Josef, 4,234,206, Cl. 280-605.000.
Toda, Minoru; and Osaka, Susumu, to RCA Corporation. Light control device using a bimorph element. 4,234,245, Cl. 350-269.000.
Tofe, Andrew J.; and Francis, Marion D., to Procter & Gamble Company, The. Radiographic scanning. 4,234,562, Cl. 424-1.000.
Tokico Ltd.: *See*—
Horino, Kunio, 4,234,016, Cl. 138-30.000.
Tokuhara, Masaharu: *See*—
Hongu, Masayuki; Kawakami, Hiromi; and Tokuhara, Masaharu, 4,234,963, Cl. 455-204.000.
Tokumaru, Hisashi; and Yasukuni, Mitsuo, to Minolta Camera Kabushiki Kaisha. Reflecting optical system for projection television. 4,234,894, Cl. 358-250.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Aoshima, Terutaka, 4,234,783, Cl. 219-441.000.
Higuchi, Kosuke, 4,234,770, Cl. 200-144.00B.
Kinoshita, Tsuneo; Sato, Kazuyuki; and Soneoka, Ryusuke, 4,234,921, Cl. 364-424.000.
Kitano, Yuichi; and Hirayama, Kaiichirou, 4,234,925, Cl. 364-494.000.
Ohkawa, Mikio; and Kawashima, Nobuo, 4,234,771, Cl. 200-144.00B.
Uehara, Tsutomu; Oguchi, Toshihiko; Kubo, Tsutomu; and Suzuki, Yukio, 4,233,935, Cl. 118-657.000.
Yamaguchi, Hiroyasu, 4,234,853, Cl. 330-280.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Gomi, Hiroshi, 4,234,858, Cl. 331-177.00R.
Iinuma, Kazuhiro, 4,234,940, Cl. 367-105.000.
Ozaki, Satoru; Ochi, Yoshiharu; and Matsumura, Kazuo, 4,234,385, Cl. 176-68.000.
Tokyo Shobundo & Co., Ltd.: *See*—
Fujimori, Sadao, 4,234,646, Cl. 428-215.000.
Tomioka, Chikanori: *See*—
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.
Tomlinson, John P.: *See*—
Thompson, David R.; and Tomlinson, John P., 4,234,641, Cl. 428-159.000.
Tompkins, Russell E.: *See*—
Frischmann, Peter G.; Luborsky, Fred E.; and Tompkins, Russell E., 4,234,360, Cl. 148-121.000.
Toray Industries, Inc.: *See*—
Iguchi, Heishaburo; and Ohigashi, Hiroji, 4,234,813, Cl. 310-366.000.
Motegi, Masahiko; Kimata, Ikukazu; and Fujita, Saburo, 4,234,532, Cl. 264-235.800.
Okamoto, Miyoshi; Yoshida, Syusuke; and Inada, Shigeru, 4,234,022, Cl. 139-420.00R.
Yamamoto, Ryuichi, 4,234,398, Cl. 204-130.000.
Toray Silicone Company, Ltd: *See*—
Nakamura, Akito, 4,234,702, Cl. 525-100.000.
Toro Company, The: *See*—
Tsuchiya, William S., 4,233,735, Cl. 30-276.000.
Torrey, Charles T., to United Technologies Corporation. Nondestructive metallographic examination of gas turbine components. 4,234,397, Cl. 204-129.350.
Torroja, Jaime M.; Rivacoba, Jose U.; and Herrero, Ricardo M., to Sener Ingenieria y Sistemas, S.A. Transport vessels having liquid gas storage tanks. 4,233,921, Cl. 114-74.00R.
Toth, Steven J., to Miles Laboratories, Inc. Refrigeration apparatus. 4,233,817, Cl. 62-175.000.
Totterdell, Anthony C., to Thorn Domestic Appliances (Electrical) Limited. Cooking appliance controls. 4,234,784, Cl. 219-506.000.
Toussaint, Herbert; Schroeder, Wolfgang; and Franzischka, Wolfgang, to BASF Aktiengesellschaft. Preparation of amines. 4,234,727, Cl. 544-178.000.
Townsend Engineering Company: *See*—
Smith, David W.; and Paar, Mark W., 4,233,709, Cl. 17-1.00F.
Toyo Kogyo Co., Ltd.: *See*—
Chihara, Takeshi; and Kono, Masanori, 4,234,153, Cl. 248-475.00B.
Harasaki, Hayatsugu; and Teramoto, Isao, 4,234,225, Cl. 296-185.000.
Toyo Soda Manufacturing Company, Limited: *See*—
Sakanaka, Yasuhiro; and Narui, Mamoru, 4,234,704, Cl. 525-215.000.
Toyota, Hiroshi; Kawamoto, Tamio; and Takehiro, Etsusou. Dual stage fluid clutch motor with electric controls including time delay. 4,234,066, Cl. 192-0.092.
Tracey, Robert J.; Bradley, Stevan D.; and Hartley, William F., to GTE Automatic Electric Laboratories Incorporated. Method and apparatus for generating timing phase error signals in PSK demodulators. 4,234,957, Cl. 375-86.000.
Tregoning, Geoffrey R., to Westinghouse Brake & Signal Co. Ltd. Slack adjuster means. 4,234,064, Cl. 188-196.0BA.
Tresner, Homer D.; Fantini, Amedeo A.; Borders, Donald B.; and McGahren, William J., to American Cyanamid Company. Antibacterial antibiotic BM782. 4,234,717, Cl. 536-17.00R.
Triggs, Dennis R.: *See*—
Coulter, Howard W.; and Triggs, Dennis R., 4,233,749, Cl. 33-189.000.
Troillet, Willy. Device for testing the section of a flat key. 4,233,746, Cl. 33-174.00F.
Trott, Clarence R.; and Willer, David A., to Deere & Company. Hydraulic cylinder assembly for two-stage discharge on manure spreader. 4,234,130, Cl. 239-679.000.
Troy, Daniel C.: *See*—
Wilhelmi, Allan R.; and Troy, Daniel C., 4,234,426, Cl. 210-149.000.
TRW Inc.: *See*—
Rechin, Francis J.; and Vargo, Edward J., 4,234,336, Cl. 75-65.00R.
Scheppele, James E., 4,234,357, Cl. 148-1.500.
Tschamper, Otto, to Swiss Aluminium Ltd. Process for the manufacture of coarse aluminum hydroxide. 4,234,559, Cl. 423-629.000.
Tsuchiya, William S., to Toro Company, The. Flexible line cutting apparatus. 4,233,735, Cl. 30-276.000.
Tsuda, Yasuo: *See*—
Iwama, Hideaki; Koyama, Mikio; Asano, Masao; and Tsuda, Yasuo, 4,234,671, Cl. 430-213.000.
Tummala, Rao R.: *See*—
Herron, Lester W.; Master, Raj N.; and Tummala, Rao R., 4,234,367, Cl. 156-89.000.
Turbeville, Joseph E. Method and apparatus for pollutant spill control. 4,234,420, Cl. 210-671.000.
Turner, Daniel L.: *See*—
Wilde, Calvin D.; and Turner, Daniel L., 4,234,922, Cl. 364-426.000.
Turner, William L. A.: *See*—
Boniface, John A.; Field, Ronald E.; Gwynn, Eric C.; and Turner, William L. A., 4,233,755, Cl. 35-11.00R.
Twyman, Noel H.; and Jenkins, Robert F., to Automated Production Systems Corporation. Scrap metal fed system for a closed rotary kiln or heating oven. 4,234,283, Cl. 414-171.000.
Tylisz, Eugene R.: *See*—
Przybylinski, Thomas L.; and Tylisz, Eugene R., 4,234,221, Cl. 292-256.500.
Tyson, Raymond K. Pill dispenser with safety features. 4,234,093, Cl. 206-536.000.
Ube Industries, Ltd.: *See*—
Umemura, Sumio; Matsui, Kanenobu; Ikeda, Yoshinari; Masunaga, Katsuro; and Kadota, Takumi, 4,234,740, Cl. 560-81.000.
Uchida, Isamu; and Watanabe, Kenkichi, to Laurel Bank Machine Co., Ltd. Adjusting means for money handling machines. 4,234,002, Cl. 133-1.00A.
Udall, Humfrey N.: *See*—
Rudd, Wallace C.; and Udall, Humfrey N., 4,234,776, Cl. 219-76.170.

Uehara, Tsutomu; Oguchi, Toshihiko; Kubo, Tsutomu; and Suzuki, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic brush apparatus for electrostatic printing system. 4,233,935, Cl. 118-657.000.

Uehara, Yasuo: *See*—
Nishimura, Yasushi; Uehara, Yasuo; and Haga, Tamio, 4,234,460, Cl. 252-447.000.

Ui, Michio: *See*—
Kanbayashi, Yoshinori; Ui, Michio; Hosoda, Koichi; Ito, Akira; Kurokawa, Shigeki; Terashima, Akio; Takahashi, Isamu; Yajima, Motoyuki; Tomioka, Chikanori; Nakamura, Tsutomu; Nogimori, Katsumi; and Okamoto, Taira, 4,234,570, Cl. 424-177.000.

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Umezawa, Kazumi: *See*—
Miyake, Hiroyuki; Umezawa, Kazumi; Ogawa, Hiroshi; Kishi, Hitotoshi; Sagara, Seiji; and Hara, Hiroshi, 4,234,305, Cl. 432-59.000.

Union Carbide Corporation: *See*—
Amembal, Amar; Bostwick, Robert; and Shaw, Richard G., 4,234,656, Cl. 428-379.000.
D'Silva, Themistocles D. J., 4,234,580, Cl. 424-246.000.
Olabisi, Olagoke, 4,234,642, Cl. 428-188.000.
Stanley, Priscilla B.; and Ritscher, James S., 4,234,549, Cl. 423-245.000.

Union Oil Company of California: *See*—
Erich, Otis G., Jr., 4,234,053, Cl. 181-121.000.

Uniroyal, Inc.: *See*—
Bruns, James A., 4,233,852, Cl. 474-153.000.
Hagen, Edward L., 4,234,445, Cl. 252-182.000.
Stiebel, Ariel, 4,233,838, Cl. 73-146.000.

United Aircraft Products, Inc.: *See*—
Desalve, Dennis W., 4,233,821, Cl. 64-32.00R.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Bailey, Alan; and Maggs, Frederick A. P., 4,234,326, Cl. 55-278.000.

United States Gypsum Company: *See*—
Balinski, Henry A., 4,233,833, Cl. 72-180.000.

United States of America
Administrator U.S. Environmental Protection Agency: *See*—
Lubowitz, Hyman R., 4,234,632, Cl. 428-2.000.
Air Force: *See*—
Charette, Ray O.; and Yates, Elmer J., 4,234,144, Cl. 244-160.000.
Army: *See*—
DuBuske, Stanley; Smith, Willis M.; Daly, Edward; Newman, Albert F.; Branovich, Louis E.; and Hager, Adolph G., 4,234,622, Cl. 427-45.100.
Hartman, Richard L., 4,234,851, Cl. 328-145.000.
Miller, Walter E., Jr.; Duke, Jimmy R.; Starkey, George W.; and Sitton, Robert L., 4,234,141, Cl. 244-3.130.
Energy: *See*—
Andersson, Clarence A., 4,234,343, Cl. 106-73.200.
Beeson, Justin L., 4,234,319, Cl. 44-1.00R.
Duncan, Dennis A.; Beeson, Justin L.; Oberle, R. Donald; and Dirksen, Henry A., 4,234,407, Cl. 208-8.00R.
Duncan, Dennis A., 4,234,408, Cl. 208-8.00R.
Gray, James, Jr., 4,234,949, Cl. 370-41.000.
Moore, Albert S.; and Verhoff, Francis H., 4,234,423, Cl. 210-758.000.
Morgan, Chester S.; and Johnson, William R., 4,234,338, Cl. 75-235.000.
Pulley, Howard; and Seltzer, Steven F., 4,234,555, Cl. 423-484.000.
Wolson, Raymond D.; and McPheeters, Charles C., 4,234,449, Cl. 252-301.10W.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Lutes, Georg F., Jr. Precise RF timing signal distribution to remote stations. 4,234,971, Cl. 455-619.000.
Margolis, Jack S.; and Shumate, Michael S. Stark cell optoacoustic detection of constituent gases in sample. 4,234,258, Cl. 356-437.000.
Rosser, Robert W.; and Psarras, Theodore. Perfluoroalkyl polytriazines containing pendent iododifluoromethyl groups. 4,234,715, Cl. 528-362.000.
Navy: *See*—
Hartley, Frederick; Slocum, Keith; Newquist, John; and Moga, Nicholas, 4,233,902, Cl. 102-41.000.
Hollan, Mark E.; and Bayles, John J., 4,234,044, Cl. 169-14.000.
Keller, Teddy M.; and Griffith, James R., 4,234,712, Cl. 528-9.000.
Yost, David J.; Arrow, Arthur; and Konigsberg, Robert L., 4,234,142, Cl. 244-3.210.

U.S. Philips Corporation: *See*—
Dijkmans, Eise C.; Ijff, Barend; and Reuvekamp, Antonius H. J., 4,234,763, Cl. 179-77.000.
Engelen, Willy L. J., 4,234,818, Cl. 315-49.000.
Eshraghian, Kamran; and Bogner, Robert E., 4,234,923, Cl. 364-436.000.
Esser, Leonard J. M.; and Heldens, Ludovicus G. M., 4,234,807, Cl. 307-304.000.
Garskamp, Arnoldus, 4,234,961, Cl. 455-160.000.
Van Nie, Cornelis P.; Werner, Franz; Maryschka, Gerhard; and Sieben, Joannus H. F. C., 4,234,140, Cl. 242-199.000.
Wehler, Herbert, 4,233,895, Cl. 101-93.050.
Willems, Gerardus A. M.; and Tichelaar, Gerrit W., 4,234,778, Cl. 219-121.00P.
Willems, Gerardus A. M., 4,234,779, Cl. 219-121.00P.

United States Steel Corporation: *See*—
Pringle, William L., 4,234,120, Cl. 228-173.00C.

United Technologies Corporation: *See*—
Maher, John F., 4,234,323, Cl. 55-97.000.
Torrey, Charles T., 4,234,397, Cl. 204-129.350.

University of California, The Regents of the: *See*—
Bennion, Douglas N.; and Wang, Su-Chee S., 4,234,667, Cl. 429-81.000.
DeLuca-McElroy, Marlene A., 4,234,681, Cl. 435-8.000.
Kaplan, Donald A.; and Wilcox, Gary L., 4,234,400, Cl. 204-180.00G.
Rapoport, Henry; and Snyder, Clinton D., 4,234,746, Cl. 568-633.000.

University of Delaware: *See*—
Simmons, Walter J., 4,233,813, Cl. 60-496.000.

University of Utah: *See*—
Raemer, Daniel B.; Gehmlich, Dietrich K.; and Westenskow, Dwayne R., 4,233,842, Cl. 73-861.040.
Seader, Junior D., 4,234,391, Cl. 203-26.000.

UOP Inc.: *See*—
Antos, George J., 4,234,458, Cl. 252-441.000.
Antos, George J., 4,234,459, Cl. 252-441.000.
Christman, William J., 4,234,544, Cl. 422-256.000.
Homeier, Edwin H.; and Johnson, Russell W., 4,234,455, Cl. 252-430.000.
Jones, Evan A., 4,234,314, Cl. 23-230.00A.
Mikulicz, Michael Z., 4,234,750, Cl. 585-332.000.
Priegnitz, James W., 4,234,520, Cl. 568-937.000.
Thompson, Gregory J., 4,234,41 i., Cl. 208-74.000.
Urban, Peter, 4,234,547, Cl. 423-242.000.

Uozumi, Yukio; and Yagi, Masaharu, to Kawasaki Jukogyo Kabushiki Kaisha. Means for feeding electric power to track guided vehicles. 4,234,065, Cl. 191-29.00R.

Upjohn Company, The: *See*—
Kelly, Robert C., 4,234,492, Cl. 260-345.200.
Kelly, Robert C., 4,234,493, Cl. 260-345.200.
Nelson, Stephen J., 4,234,521, Cl. 260-937.000.
Satoh, Paul S., 4,234,404, Cl. 204-299.00R.

Urban, Peter, to UOP Inc. Flue gas treatment. 4,234,547, Cl. 423-242.000.

Usui, Kiyoshi: *See*—
Yukuta, Toshio; Ishiwaka, Takumi; and Usui, Kiyoshi, 4,234,695, Cl. 521-107.000.

Vadetec Corporation: *See*—
Kemper, Yves J., 4,233,851, Cl. 74-191.000.
Kemper, Yves J., 4,233,859, Cl. 74-690.000.

Vahlensieck, Hans-Joachim: *See*—
Kappler, Fritz-Robert; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,234,503, Cl. 556-413.000.

Vakuum Vulk Holdings Limited: *See*—
Schelkmann, Wilhelm, 4,234,369, Cl. 156-95.000.

Valyi, Emery I. Apparatus for the preparation of hollow plastic articles. 4,234,302, Cl. 425-526.000.

Van Bakel, Hermanus C. C. K.: *See*—
Akkerman, Antony M.; Van Bakel, Hermanus C. C. K.; and van Breevoort-Uurbanus, Henriette G., 4,234,591, Cl. 424-267.000.

Van Berkel, Johannes; and Kelderman, Hendrik C., to Shell Oil Company. Cyclopropane derivatives. 4,234,512, Cl. 568-420.000.

van Breevoort-Uurbanus, Henriette G.: *See*—
Akkerman, Antony M.; Van Bakel, Hermanus C. C. K.; and van Breevoort-Uurbanus, Henriette G., 4,234,591, Cl. 424-267.000.

van der Lely, Cornelis. Mowing machine. 4,233,805, Cl. 56-192.000.

Vanderslice, Wilbur B., Jr., to International Business Machines Corporation. V-Groove charge-coupled device. 4,234,887, Cl. 357-24.000.

van der Zeeuw, Abraham J.; Koenders, Peter; and Kok, Riekert, to Shell Oil Company. Liquid/liquid extraction of nickel values. 4,234,546, Cl. 423-139.000.

Van Egmond, Jacobus H.; and Lichtenveldt, to Hoogovens IJmuiden, B. V. System for control of a coking plant. 4,234,390, Cl. 202-262.000.

Van Horn, Albert R.: *See*—
Cooper, Gary F.; and Van Horn, Albert R., 4,234,491, Cl. 260-340.9AS.

Van Ness, Bradford O.; and Weimer, Dan G., to Engineered Systems, Inc. Power failure detection and restart system. 4,234,920, Cl. 364-200.000.

Van Nie, Cornelis P.; Werner, Franz; Maryschka, Gerhard; and Sieben, Joannus H. F. C., to U.S. Philips Corporation. Magnetic tape cassette drive system. 4,234,140, Cl. 242-199.000.

Van Nieuwal, John G.; Montgomery, Edward L.; and Beeghly, Richard M., to Goodyear Tire & Rubber Company, The. Tire carcass structure. 4,234,030, Cl. 152-354.00R.

Vanoni, Pier L.; Serboli, Giancarlo; and De Marchi, Franco, to Anic, S.p.A. Microfibrous structures. 4,234,652, Cl. 428-296.000.

Van Scott, Eugene J.; and Yu, Ruey J. Treatment of skin keratoses with α-hydroxy acids and related compounds. 4,234,599, Cl. 424-279.000.

Van Slooten, Roland W.: *See*—
Donnelly, Bernard P.; and Van Slooten, Roland W., 4,234,280, Cl. 414-35.000.

Vansteelant, Marc G., to Sperry Corporation. Knotter with improved billhook and actuation mechanism. 4,234,219, Cl. 289-2.000.

Vargo, Edward J.: *See*—
Rechin, Francis J.; and Vargo, Edward J., 4,234,336, Cl. 75-65.00R.

Variable Control Systems, Inc.: *See—*
Seiz, Frederick G.; and Seiz, Carl G., 4,234,069, Cl. 193-35.00A.
Varian Associates, Inc.: *See—*
Boehme, Detlef R., 4,234,427, Cl. 210-198.00C.
Vasvari nee Debreczy, Lelle V.: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Breining, Tibor; Virag, Sandor; Vasvari nee Debreczy, Lelle V.; Horvath, Agnes; Nagy, Gabor; Mandi, Attila; Szucs, Tamas; Bitter, Istvan; and Sebestyen, Gyula, 4,234,586, Cl. 424-251.000.
VDO Adolf Schindling AG: *See—*
Stark, Wolfgang, 4,234,878, Cl. 340-642.000.
Veb Textima Wirkmaschinenbau Karl Marx Stadt: *See—*
Schneider, Manfred, 4,233,824, Cl. 66-87.000.
Vedder, James L., to Mead Corporation, The. Ink jet printer assembly and alignment of printer components. 4,234,884, Cl. 346-75.000.
Venable, Edward R., to Western Electric Company Inc. Apparatus for forming twisted conductor units. 4,233,807, Cl. 57-58.520.
Venkatesan, Thirumalai N. C.: *See—*
Auston, David H.; Golovchenko, Jene A.; and Venkatesan, Thirumalai N. C., 4,234,356, Cl. 148-1.500.
Verhoff, Francis H.: *See—*
Moore, Albert S.; and Verhoff, Francis H., 4,234,423, Cl. 210-758.000.
Verma, Arun: *See—*
Barabas, Miklos F.; Cooke, William B.; Hardy, R. H. Stephen; and Verma, Arun, 4,234,782, Cl. 219-365.000.
Verschuur, Eke, to Shell Oil Company. Process for the agglomeration of solids. 4,234,320, Cl. 44-23.000.
Vestra-Union, S.A.: *See—*
Zaehringer, Andre, 4,234,110, Cl. 223-57.000.
Vickers Limited: *See—*
Moncaster, Michael B.; and Rummer, James D., 4,234,199, Cl. 277-237.00R.
Vickery, Brian H.: *See—*
Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., 4,234,571, Cl. 424-177.000.
Victor Company of Japan Ltd.: *See—*
Shibata, Norio, 4,234,195, Cl. 274-39.00R.
Vigander, Kjell: *See—*
Gjerde, Trygve; Vigander, Kjell; Jenssen, Dag N.; and Hjertas, Bjorn, 4,234,270, Cl. 405-202.000.
Vignale, Grace M. Shower shelf. 4,233,911, Cl. 108-30.000.
Vilkomerson, David H. R.: *See—*
Larach, Simon; and Vilkomerson, David H. R., 4,233,989, Cl. 128-661.000.
Vinals, Joaquin F.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,234,463, Cl. 252-522.00R.
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Viramontes, Jose A., to Shell Oil Company. Hopper and feed wheel assembly for a fertilizer spreader. 4,234,105, Cl. 222-233.000.
Visentin, Bruno: *See—*
Guglielmi, Nicolo; Dagna, Giandomenico; and Visentin, Bruno, 4,234,871, Cl. 340-365.00S.
Visser, Frederick J., to Von Rohr Equipment Corp., a part interest. Concrete pile cutting device. 4,233,954, Cl. 125-14.000.
Vock, Manfred H.: *See—*
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,234,616, Cl. 426-536.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,234,463, Cl. 252-522.00R.
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Bachner, Ernst, 4,234,036, Cl. 164-420.000.
Patuzzi, Alexander; Riegler, Ernst; and Schmidt, Manfred, 4,234,171, Cl. 266-248.000.
Voinea, Maria I.: *See—*
Voinea, Vasile; Catuneanu, Vasile; Birzu, Ioan; Teisanu, Eugen; Voinea, Maria I.; and Patrascu, Sorin, 4,234,794, Cl. 250-416.0TV.
Voinea, Vasile; Catuneanu, Vasile; Birzu, Ioan; Teisanu, Eugen; Voinea, Maria I.; and Patrascu, Sorin, to Statia de Verificare si Intretinere a Aparaturii Medicale. Installation of radiodiagnosis with sweep. 4,234,794, Cl. 250-416.0TV.
Volterra, Alessandro: *See—*
Paoletti, Ugo; and Volterra, Alessandro, 4,234,312, Cl. 8-151.200.
Von Rohr Equipment Corp.: *See—*
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von Alpen, Ulrich: *See—*
Rabenau, Albrecht; von Alpen, Ulrich; Schonherr, Erich; and Muller, Gertraude, 4,234,554, Cl. 423-409.000.
von Isenburg, Carl: *See—*
Wallace, Clifford G.; von Isenburg, Carl; Chun, Michael D.; Holmberg, Kenneth G.; and Bryant, Robert T., 4,234,926, Cl. 364-551.000.
Voss, Eckart: *See—*
Petersen, Uwe; Voss, Eckart; Metzger, Karl G.; and Stadler, Peter, 4,234,572, Cl. 424-180.000.
Vulcan Materials Company: *See—*
Franks, John A., Jr., 4,234,403, Cl. 204-180.00P.
W. H. Brady Co.: *See—*
Barbieri, Joseph C.; and Wirth, Gary J., 4,234,090, Cl. 206-459.000.
W. R. Grace & Co.: *See—*
Hein, Paul R.; Evans, James A.; and Yang, Michael W., 4,234,676, Cl. 430-286.000.
W. Schlafhorst & Co.: *See—*
Kamp, Heinz, 4,233,810, Cl. 57-270.000.
Wacker-Chemie GmbH: *See—*
Falbesaner, Egon; Bichler, Josef; and Wimmer, Eberhard, 4,234,422, Cl. 210-713.000.
Waggon Union GmbH: *See—*
Bugarcic, Helmut, 4,233,904, Cl. 104-138.00R.
Wagman, Gerald H.: *See—*
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,234,685, Cl. 435-80.000.
Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., 4,234,690, Cl. 435-119.000.
Wagner, Gary L.: *See—*
Lange, Julius; and Wagner, Gary L., 4,234,954, Cl. 371-6.000.
Wagner, Richard C., to Hollymatic Corporation. Molding apparatus. 4,233,710, Cl. 17-32.000.
Wakabayashi, Hisao: *See—*
Hishida, Hiroshi; Nakayama, Toshihiko; Koyama, Isao; and Wakabayashi, Hisao, 4,234,811, Cl. 310-348.000.
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Ward, Robert C., to Commercial Affiliates, Inc. Binder material seam. 4,234,649, Cl. 428-255.000.
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Webster, Ralph K., to H. K. Webster Company, Inc. Disposable wild bird feeder. 4,233,941, Cl. 119-52.00R.
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Dravnieks, Konstantins, 4,234,038, Cl. 165-10.000.
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Wepf, Alfred, to Acrow-Richmond Limited. Snap-tie. 4,234,156, Cl. 249-40.000.
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Westall, Stephen, to Dow Corning Limited. Siloxanes. 4,234,574, Cl. 424-184.000.
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Gursky, Michael T., 4,234,666, Cl. 428-573.000.
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Cookson, Alan H., 4,234,006, Cl. 137-15.000.
Ford, Daniel E.; and Pyle, Jeffrey A., 4,233,748, Cl. 33-180.00R.
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Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., 4,234,476, Cl. 260-112.00R.
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Widmayer, Don F., to Controlled Environments Systems. Light regulation system. 4,234,820, Cl. 315-152.000.
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Wilde, Calvin D.; and Turner, Daniel L., to SAB Harmon Industries, Inc. Automatic locomotive speed control. 4,234,922, Cl. 364-426.000.
Wilder, Paul R.; and Oberrecht, David A., to Dover Corporation. Linkage assembly for a coupler. 4,234,161, Cl. 251-149.900.
Wilhelmi, Allan R.; and Troy, Daniel C., to Sterling Drug Inc. Wet combustion system incorporating autoregulation. 4,234,426, Cl. 210-149.000.
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Willems, Gerardus A. M.; and Tichelaar, Gerrit W., to U.S. Philips Corporation. Method of and welding torch for arc welding. 4,234,778, Cl. 219-121.00P.
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Williams, Bill D. Watch band assembly. 4,234,115, Cl. 224-168.000.
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Williams, James D. Animal ear protectors. 4,233,942, Cl. 119-96.000.
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Williams, William H., to Sandstone, Inc. Security structure. 4,234,875, Cl. 340-550.000.
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Willis, Donald H., to RCA Corporation. High voltage disabling circuit for a television receiver. 4,234,829, Cl. 315-411.000.
Wills, Bill R. Compressed air system having an air dryer. 4,234,327, Cl. 55-310.000.
Wilmes, Manfred; Obst, Rudiger; and Kretzachmar, Wolfgang, to C. A. Weidmuller KG. Earthing terminal. 4,234,239, Cl. 339-198.0GA.
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Winslow, John S., to MCA Discovision, Inc. Digital center tracking system. 4,234,837, Cl. 318-577.000.

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Wittel, Frederick H. Cushioned printing laminate. 4,234,640, Cl. 428-159.000.

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Woolcock, Alan; Lowe, Bryan W. H.; and Walters, Colin R., to Imi Kynoch Limited. Electrical windings. 4,234,861, Cl. 335-216.000.

Wooler, Alan M., to Imperial Chemical Industries Limited. Process for making polyurea foams utilizing imidazole catalysts. 4,234,693, Cl. 521-107.000.

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Wu, Yulin; and Marwil, Stanley J., to Phillips Petroleum Company. Dehydration of alcohols. 4,234,752, Cl. 585-640.000.

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Miller, Charles G.; and Stephens, James B., 4,234,098, Cl. 220-86.00R.

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Yamamoto, Masachika, to Sumitomo Electric Industries, Ltd. Wear alarm device for a ventilated disk brake. 4,234,058, Cl. 188-1.00A.

Yamamoto, Ryuichi, to Toray Industries, Inc. Carbon fiber surface treatment. 4,234,398, Cl. 204-130.000.

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Yanagihara, Kazuhiko: *See*—
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Yardley, Lloyd M., to Empire Plastics Manufacturing Inc. Volume and flow-rate dependent inspirator. 4,233,990, Cl. 128-728.000.

Yarrow, Harry A. Control system for gas kiln. 4,234,124, Cl. 236-15.0BG.

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Yeoman, Neil; and Stern, Sidney S., to Halcon Research and Development Corp. Recovery of methacrolein. 4,234,519, Cl. 568-492.000.

Yerman, Arthur J. Anti-drug abuse single-use syringe. 4,233,975, Cl. 128-218.00P.

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Burk, Emmett H., Jr.; Yoo, Jin S.; Sun, Jui-Yuan; and Karch, John A., 4,234,452, Cl. 252-419.000.

Yorioka, Keigo; and Minoura, Mikio, to Aisan Industry Co., Ltd. Exhaust gas recirculation system. 4,233,946, Cl. 123-568.000.

Yoshida, Isao: *See*—
Ota, Mitsuharu; Yoshida, Isao; and Nakano, Hiromitsu, 4,234,835, Cl. 318-317.000.

Yoshida, Koji: *See*—
Yano, Nobumitsu; Fukinbara, Itaru; Yoshida, Koji; and Wakiyama, Yutaka, 4,234,619, Cl. 426-614.000.

Yoshida, Mitunari: *See*—
Teshima, Toru; Ariga, Kazuo; and Yoshida, Mitunari, 4,234,817, Cl. 313-493.000.

Yoshida, Syusuke: *See*—
Okamoto, Miyoshi; Yoshida, Syusuke; and Inada, Shigeru, 4,234,022, Cl. 139-420.00R.

Yoshida, Takao; and Hall, John B., to International Flavors & Fragrances Inc. Ketones and organoleptic uses thereof. 4,234,518, Cl. 568-377.000.

Yoshimoto, Shinji; Fujiwhara, Mitsuto; Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Nakagawa, Satoshi, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic materials. 4,234,678, Cl. 430-564.000.

Yoshinaga, Makoto: *See*—
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,234,023, Cl. 141-99.000.

Yost, David J.; Arrow, Arthur; and Konigsberg, Robert L., to United States of America, Navy. High angle-of-attack missile control system for aerodynamically controlled missiles. 4,234,142, Cl. 244-3.210.

Yost, Richard A.: *See*—
Enke, Christie G.; Yost, Richard A.; and Morrison, James D., 4,234,791, Cl. 250-281.000.

Young, Lewis B., to Mobil Oil Corporation. Selective cracking of phenylalkanes. 4,234,751, Cl. 585-486.000.

Yu, Ruey J.: *See*—
Van Scott, Eugene J.; and Yu, Ruey J., 4,234,599, Cl. 424-279.000.

Yukl, Tex N., to Near Field Technology Co. Electromagnetic noncontacting measuring apparatus. 4,234,844, Cl. 324-58.50A.

Yukuta, Toshio; Ishiwaka, Takumi; and Usui, Kiyoshi, to Bridgestone Tire Co., Ltd. Method of producing polyurea foams. 4,234,695, Cl. 521-107.000.

Yusa, Hideo: *See*—
Kamiya, Kunio; Yusa, Hideo; Kitamura, Masao; Takeshima, Masaki; and Ishidate, Toshio, 4,234,456, Cl. 252-438.000.

Z-L Limited Partnership: *See*—
Zilliken, Fritz W., 4,234,577, Cl. 424-238.000.

Zacharias, Hermann: *See*—
Schumacher, Heinz; and Zacharias, Hermann, 4,234,860, Cl. 333-187.000.

Zaehringer, Andre, to Vestra-Union, S.A. Device for folding-down and pressing jacket collars. 4,234,110, Cl. 223-57.000.

Zavadskaya, Anna S.: *See*—
Bondar, Petr G.; and Zavadskaya, Anna S., 4,234,462, Cl. 252-463.000.

Zehner, Peter: *See*—
Kuerten, Heribert; Nagel, Otto; and Zehner, Peter, 4,234,560, Cl. 423-659.000.

Zenith Radio Corporation: *See*—
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Ziegenhorn, Joachim: *See*—
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Zielinski, Richard J.: *See*—
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Zilliken, Fritz W., to Z-L Limited Partnership. Ergostadientriols, compositions containing same, and methods of preparing and using same. 4,234,577, Cl. 424-238.000.

Zimmer, Karl E.: *See*—
Berthold, Heinz; and Zimmer, Karl E., 4,234,077, Cl. 198-712.000.

Zimmerman, Robert E.: *See*—
Adams, Michael B.; Angold, John A.; Morrison, Robert B.; and Zimmerman, Robert E., 4,233,909, Cl. 105-4.00R.

Zimmerman, William R., to General Electric Company. Multiple insert tool assembly for threading, grooving and the like. 4,233,867, Cl. 82-36.00R.

ZLEHIT pri BAN: *See*—
Moshtev, Rafail V.; Budevska, Hrisanta N.; Ivanova, Latinka T.; and Yankova, Radka D., 4,234,623, Cl. 427-54.100.

Zollinger, David T.: *See*—
Howard, Paulette A.; Campbell, Michael F.; and Zollinger, David T., 4,234,620, Cl. 426-656.000.

Zurflun, Rene: *See*—
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Zweifel, Michael R. Fish tank rock cleaner. 4,233,702, Cl. 15-1.700.

LIST OF REISSUE PATENTEES

TO WHOM

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Casey, Robert, to Caterpillar Tractor Co. Rim construction and tool apparatus for safe tire inflation. Re. 30,436, Cl. 152-310.000.

Caterpillar Tractor Co.: *See*—
Casey, Robert, Re. 30,436, Cl. 152-310.000.

Dew, Robert C., to S & T Industries, Inc. Corner assembly for fireplace enclosure. Re. 30,437, Cl. 126-139.000.

S & T Industries, Inc.: *See*—
Dew, Robert C., Re. 30,437, Cl. 126-139.000.

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Action Industries, Inc.: *See*—
Piero, Niccolai, 257,521, Cl. D4-06.000.

Aksamit, Frank J., to Pro Sharp Corporation. Saw chain sharpening assembly. 257,527, 11-18-80, Cl. D8-71.000.

Allsop, James D. Ski pole storage rack. 257,523, 11-18-80, Cl. D6-157.000.

Andrea Raab Corporation: *See*—
Fox, James H.; Yablans, Gerald; and Tuchman, Stephan A., 257,541, Cl. D28-59.000.

Beatrice Foods Co.: *See*—
Chow, Ho; and Muramatsu, David, 257,537, Cl. D23-17.000.

Bell & Howell Company: *See*—
Zellner, John R.; and Lehto, Eino M., 257,535, Cl. D16-11.000.

Berman, James S., to Citibank, N.A. Drive-up banking building. 257,538, 11-18-80, Cl. D25-33.000.

Berman, James S., to Citibank, N.A. Walk-up banking building. 257,539, 11-18-80, Cl. D25-33.000.

Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased (by Noyes, Mary D., executrix); and New England Merchants National Bank, by, executor, to Discovision Associates. Video disk player. 257,533, 11-18-80, Cl. D14-3.000.

Boyle, Patrick T.: *See*—
Herbst, David H.; and Boyle, Patrick T., 257,526, Cl. D7-104.000.

Bruce, Gordon P.: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.

Casa Flora, Inc.: *See*—
Raap, Joachim E., 257,529, Cl. D11-164.000.

Castelli, Bertrand. Ball paddle for table game. 257,545, 11-18-80, Cl. D21-213.000.

Cherry, Richard S., to Phillips-Parkway Corporation. Container bin. 257,528, 11-18-80, Cl. D9-431.000.

Chow, Ho; and Muramatsu, David, to Beatrice Foods Co. Spray wand. 257,537, 11-18-80, Cl. D23-17.000.

Chung Ah Manufacturing Co., Ltd.: *See*—
Yip, Wan K., 257,540, Cl. D26-41.000.

Citibank, N.A.: *See*—
Berman, James S., 257,538, Cl. D25-33.000.
Berman, James S., 257,539, Cl. D25-33.000.

Danielson, David C.: *See*—
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Discovision Associates: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.

Formosa, Daniel J.: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.

Fox, James H.; Yablans, Gerald; and Tuchman, Stephan A., to Andrea Raab Corporation. Nail buffer. 257,541, 11-18-80, Cl. D28-59.000.

Gorretta, Andrew. Foal feeder. 257,542, 11-18-80, Cl. D30-13.000.

Hawthorne, Allen D.: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.

Heinrich, William, to Volna Promotions, Inc. Drinking mug. 257,524, 11-18-80, Cl. D7-9.000.

Herbst, David H.; and Boyle, Patrick T., to Maryland Cup Corporation. Combined scoop and serving cup. 257,526, 11-18-80, Cl. D7-104.000.

Hickman, Kim M.; and Young, Ralph C., to White Automotive Corporation. Vehicle top. 257,531, 11-18-80, Cl. D12-156.000.

Ikeda, Makoto, to R & D Office Makoto Ltd. Tone-arm. 257,534, 11-18-80, Cl. D14-27.000.

Johnson, William H., to Shenandoah Manufacturing Co., Inc. Poultry watering valve. 257,543, 11-18-80, Cl. D23-19.000.

Johnson, William H., to Shenandoah Manufacturing Co., Inc. Poultry watering valve. 257,544, 11-18-80, Cl. D23-19.000.

Lehto, Eino M.: *See*—
Zellner, John R.; and Lehto, Eino M., 257,535, Cl. D16-11.000.

Leib, Roger K. Multiple seating unit. 257,522, 11-18-80, Cl. D6-59.000.

Lukes, John R. Skateboard. 257,536, 11-18-80, Cl. D21-227.000.

Maryland Cup Corporation: *See*—
Herbst, David H.; and Boyle, Patrick T., 257,526, Cl. D7-104.000.

Moyer, Richard D. Boat hull. 257,530, 11-18-80, Cl. D12-70.000.

Muramatsu, David: *See*—
Chow, Ho; and Muramatsu, David, 257,537, Cl. D23-17.000.

New England Merchants National Bank, by, executor: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.

Noyes, Eliot F., deceased: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.

Noyes, Mary D., executrix: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.

Okland, Merlyn C. Running board. 257,532, 11-18-80, Cl. D12-203.000.

Phillips-Parkway Corporation: *See*—
Cherry, Richard S., 257,528, Cl. D9-431.000.

Piero, Niccolai, to Action Industries, Inc. Combined brush and scraper. 257,521, 11-18-80, Cl. D4-06.000.

Princeton Industries Corporation: *See*—
Stahel, Alwin J., II, 257,525, Cl. D7-37.000.

Pro Sharp Corporation: *See*—
Aksamit, Frank J., 257,527, Cl. D8-71.000.

R & D Office Makoto Ltd.: *See*—
Ikeda, Makoto, 257,534, Cl. D14-27.000.

Raap, Joachim E., to Casa Flora, Inc. Combined plant pot liner and water level gauge. 257,529, 11-18-80, Cl. D11-164.000.

Roehrs, Kurt: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.

Shenandoah Manufacturing Co., Inc.: *See*—
Johnson, William H., 257,543, Cl. D23-19.000.
Johnson, William H., 257,544, Cl. D23-19.000.

Siegel, Paul F.: *See*—
Bevilacqua, Ernest M.; Bruce, Gordon P.; Danielson, David C.; Formosa, Daniel J.; Hawthorne, Allen D.; Roehrs, Kurt; Siegel, Paul F.; Noyes, Eliot F., deceased; and New England Merchants National Bank, by, executor, 257,533, Cl. D14-3.000.

Stahel, Alwin J., II, to Princeton Industries Corporation. Serving tray. 257,525, 11-18-80, Cl. D7-37.000.

Tuchman, Stephan A.: *See*—
Fox, James H.; Yablans, Gerald; and Tuchman, Stephan A., 257,541, Cl. D28-59.000.

Volna Promotions, Inc.: *See*—
Heinrich, William, 257,524, Cl. D7-9.000.

White Automotive Corporation: *See*—
Hickman, Kim M.; and Young, Ralph C., 257,531, Cl. D12-156.000.

Yablans, Gerald: *See*—
Fox, James H.; Yablans, Gerald; and Tuchman, Stephan A., 257,541, Cl. D28-59.000.

Yip, Wan K., to Chung Ah Manufacturing Co., Ltd. Lantern. 257,540, 11-18-80, Cl. D26-41.000.

Young, Ralph C.: *See*—
Hickman, Kim M.; and Young, Ralph C., 257,531, Cl. D12-156.000.

Zellner, John R.; and Lehto, Eino M., to Bell & Howell Company. Microfilm reader. 257,535, 11-18-80, Cl. D16-11.000.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 18, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 133

1 A 4,234,002
3 A 4,234,003

CLASS 135

1 R 4,234,005

CLASS 136

89 EP 4,234,351
246 4,234,354
253 4,234,352
258 4,234,353

CLASS 137

15 4,234,006
101.19 4,234,007
182 4,234,008
219 4,234,009
242 4,234,010
312 4,234,011
504 4,234,013
557 4,234,014
625.18 4,234,015
899.1 4,234,012

CLASS 138

30 4,234,016
4,234,017
45 4,234,018
109 4,234,019
166 4,234,020

CLASS 139

371 4,234,021
420 R 4,234,022

CLASS 141

99 4,234,023

CLASS 144

213 4,234,024

CLASS 148

1.5 4,234,355
4,234,356
4,234,357
4,234,358
2 4,234,359
121 4,234,360
185 4,234,361
187 4,234,362

CLASS 149

19.4 4,234,363
4,234,364

CLASS 150

1.5 R 4,234,025
8 4,234,026

CLASS 152

213 R 4,234,027
233 4,234,028
310 Re.30,436
354 R 4,234,030
354 RB 4,234,029
356 R 4,234,031

CLASS 156

64 4,234,365
79 4,234,366
89 4,234,367
91 4,234,368
95 4,234,369
4,234,370
96 4,234,371
356 4,234,372
382 4,234,373
459 4,234,374
530 4,234,375
617 SP 4,234,376

CLASS 160

133 4,234,033
193 4,234,034
261 4,234,032
392 4,234,035

CLASS 162

3 4,234,377
138 4,234,378
145 4,234,379
152 4,234,380
158 4,234,381
263 4,234,382

CLASS 164

420 4,234,036

CLASS 165

3 4,234,037
10 4,234,038
67 4,234,039
164 4,234,040
173 4,234,041

CLASS 166

261 4,234,042
336 4,234,043

CLASS 169

14 4,234,044

CLASS 171

4,234,045

CLASS 174

5 R 4,234,753
14 R 4,234,754
19 4,234,755
38 4,234,756
73 R 4,234,757
84 R 4,234,758
104 4,234,759
138 F 4,234,760

CLASS 175

5 4,234,047
6 4,234,046
329 4,234,048

CLASS 176

37 4,234,383
58 PB 4,234,384
68 4,234,385

CLASS 177

105 4,234,049

CLASS 179

1 SM 4,234,761
18 HB 4,234,762
77 4,234,763
90 D 4,234,764
99 M 4,234,765
115.5 R 4,234,766

CLASS 180

190 4,234,050
272 4,234,051

CLASS 181

120 4,234,052
121 4,234,053
252 4,234,054

CLASS 182

63 4,234,055

CLASS 184

105 B 4,234,056

CLASS 187

9 E 4,234,057

CLASS 188

1 A 4,234,058
43 4,234,059
44 4,234,060
71.3 4,234,061
170 4,234,062
181 T 4,234,063
196 BA 4,234,064

CLASS 191

29 R 4,234,065

CLASS 192

0.092 4,234,066
98 4,234,067
106.2 4,234,068

CLASS 193

35 A 4,234,069

CLASS 194

1 N 4,234,070
100 A 4,234,071
4,234,072

CLASS 198

304 4,234,073
558 4,234,074
690 4,234,076
712 4,234,077
833 4,234,078

CLASS 199

594 4,234,075

CLASS 200

1 R 4,234,767
52 R 4,234,768
67 DB 4,234,769
144 B 4,234,770
4,234,771
153 V 4,234,772
308 4,234,773
330 4,234,774

CLASS 201

6 4,234,386
23 4,234,387
25 4,234,388
30 4,234,389

CLASS 202

262 4,234,390

CLASS 203

26 4,234,391
91 4,234,392

CLASS 204

1.5 4,234,393
5 4,234,394
12 4,234,395
51 4,234,396
129.35 4,234,397
130 4,234,398
149 4,234,401
159.15 4,234,399
162 R 4,234,402
180 G 4,234,400
180 P 4,234,403
290 F 4,234,405
292 4,234,406
299 R 4,234,404

CLASS 206

0.82 4,234,080
45.34 4,234,079
147 4,234,081
150 4,234,082
221 4,234,083
306 4,234,084
337 4,234,085
362 4,234,086
362.2 4,234,087
408 4,234,088
456 4,234,089
459 4,234,090
499 4,234,091
523 4,234,092
536 4,234,093

CLASS 208

8 R 4,234,407
4,234,408
28 4,234,409
57 4,234,410
74 4,234,411
80 4,234,412

CLASS 209

17 4,234,413
166 4,234,414
172.5 4,234,415
247 4,234,416
306 4,234,417
542 4,234,418

CLASS 210

88 4,234,425
149 4,234,426
198 C 4,234,427
321 B 4,234,428
489 4,234,430
500 M 4,234,431
664 4,234,419
671 4,234,420
713 4,234,422
728 4,234,421
758 4,234,423
771 4,234,424

CLASS 211

88 4,234,094

CLASS 215

232 4,234,095

CLASS 219

10.55 A 4,234,775
76.17 4,234,776
121 P 4,234,778
4,234,779
125.1 4,234,777
200 4,234,780
243 4,234,781
365 4,234,782
441 4,234,783
506 4,234,784
523 4,234,785
544 4,234,786

CLASS 220

1 T 4,234,096
4 D 4,234,097
86 R 4,234,098
269 4,234,099
306 4,234,100

CLASS 221

241 4,234,101

CLASS 222

55 4,234,102
83.5 4,234,103
94 4,234,104
233 4,234,105
239 4,234,106
309 4,234,107
386 4,234,108
609 4,234,109

CLASS 223

57 4,234,110
104 4,234,111

CLASS 224

42.43 4,234,112
45 A 4,234,114
45 S 4,234,113
168 4,234,115
250 4,234,116

CLASS 228

4.5 4,234,117
49 R 4,234,118
125 4,234,119
173 C 4,234,120

CLASS 229

1.5 B 4,234,121
77 4,234,122

CLASS 233

23 R 4,234,123

CLASS 235

92 MP 4,234,787

CLASS 236

15 BG 4,234,124

CLASS 239

111 4,234,125
230 4,234,126
333 4,234,127
478 4,234,128
661 4,234,129
679 4,234,130
685 4,234,131

CLASS 241

53 4,234,132

CLASS 242

45 4,234,133
55.2 4,234,134
56 R 4,234,135
68.4 4,234,136
71.8 4,234,137
131.1 4,234,138
191 4,234,139
199 4,234,140

CLASS 244

3.13 4,234,141
3.16 4,234,145
3.21 4,234,142
116 4,234,143
160 4,234,144

CLASS 248

63 4,234,146
74 R 4,234,147
174 4,234,148
184 4,234,149
281.1 4,234,150
354 S 4,234,151
404 4,234,165
415 4,234,152
475 B 4,234,153
539 4,234,154
651 4,234,155

CLASS 249

40 4,234,156

CLASS 250

227 4,234,788
234 4,234,789
238 4,234,790
281 4,234,791
361 R 4,234,792
414 4,234,793
416 TV 4,234,794
468 4,234,795
4,234,796
492 B 4,234,797
506 4,234,798
540 4,234,800
576 4,234,799

CLASS 251

56 4,234,157
144 4,234,158
4,234,159
4,234,160
149.9 4,234,161
175 4,234,162

CLASS 252

8 4,234,432
8.55 D 4,234,433
50 4,234,434
51.5 A 4,234,435
62.51 4,234,437
62.54 4,234,438
62.9 4,234,436
63.2 4,234,439
76 4,234,440
78.3 4,234,441
90 4,234,442
135 4,234,443
174.22 4,234,444
182 4,234,445
187 R 4,234,446
301.1 W 4,234,447
4,234,448
4,234,449
314 4,234,450
373 4,234,451
419 4,234,452
428 4,234,453
429 R 4,234,454
430 4,234,455
438 4,234,456
4,234,457
441 4,234,458
4,234,459
447 4,234,460
462 4,234,461
463 4,234,462
522 R 4,234,463
544 4,234,464
547 4,234,465

CLASS 254

108 4,234,163
291 4,234,167
371 4,234,164

CLASS 260

17 A 4,234,466
29.7 H 4,234,467
31.2 R 4,234,468
42.46 4,234,469
45.75 M 4,234,472
45.75 R 4,234,473
4,234,474
45.8 N 4,234,471
112 R 4,234,475
4,234,476
112.5 R 4,234,477
141 4,234,478
145 B 4,234,479
157 4,234,480
163 4,234,481
187 4,234,482
207.1 4,234,483
239 BE 4,234,484
239.3 P 4,234,485
314.5 4,234,486
315 4,234,487
326.27 4,234,488
326.42 4,234,489
340.9 AS 4,234,491
340.9 R 4,234,490
345.2 4,234,492
4,234,493
346.7 4,234,494
397.2 4,234,495
403 4,234,496
410.6 4,234,497
410.7 4,234,498
429 R 4,234,499
4,234,500
429.7 4,234,501
463 4,234,504
465 D 4,234,505
4,234,506
4,234,507
4,234,508
465.2 4,234,509
465.3 4,234,510
502.5 4,234,511
937 4,234,521

CLASS 261

23 A 4,234,522
41 D 4,234,523
4,234,524
89 4,234,525
102 4,234,527
106 4,234,526

CLASS 264

41 4,234,528
51 4,234,529
151 4,234,530
174 4,234,531
235.8 4,234,532
261 4,234,533
328.8 4,234,534
519 4,234,535
522 4,234,536

CLASS 266

128 4,234,168
156 4,234,169
158 4,234,170
248 4,234,171

CLASS 267

8 R 4,234,172
103 4,234,173

CLASS 269

37 4,234,174
73 4,234,175
156 4,234,176
241 4,234,177

CLASS 270

45 4,234,178

CLASS 271

3.1 4,234,180

CLASS 273

1 R 4,234,181
42 R 4,234,182
235 R 4,234,184
243 4,234,185
4,234,186
248 4,234,187
290 4,234,188
299 4,234,189
318 4,234,183
420 4,234,190
421 4,234,191
423 4,234,192

CLASS 274

1 A 4,234,193
10 R 4,234,194
39 R 4,234,195

CLASS 277

12 4,234,196
124 4,234,197
145 4,234,198
237 R 4,234,199

CLASS 279

2 A 4,234,200
77 4,234,201

CLASS 280

32.5 4,234,203
87.04 A 4,234,204
605 4,234,206
4,234,207
614 4,234,208
723 4,234,205
803 4,234,209
804 4,234,210
810 4,234,211
820 4,234,202

CLASS 282

27.5 4,234,212
4,234,213

CLASS 283

57 4,234,214

CLASS 285

41 4,234,215
93 4,234,216
150 4,234,217
162 4,234,218

CLASS 289

2 4,234,219

CLASS 292

148 4,234,220
256.5 4,234,221

CLASS 293

124 4,234,222

CLASS 294

88 4,234,223

CLASS 296

98 4,234,224
185 4,234,225

CLASS 297

21 4,234,226
443 4,234,227
464 4,234,228
467 4,234,229

CLASS 299

2 4,234,230
4 4,234,231
5 4,234,232
34 4,234,233
43 4,234,234
56 4,234,235

CLASS 301

6 W 4,234,236

CLASS 307

38 4,234,801
218 4,234,803
229 4,234,804
254 4,234,805
273 4,234,806
304 4,234,807

CLASS 308

26 4,234,237

CLASS 310

49 R 4,234,808
105 4,234,809
172 4,234,810
348 4,234,811
361 4,234,812
366 4,234,813

CLASS 312

184 4,234,238

CLASS 313

412 4,234,814
422 4,234,815
479 4,234,816
493 4,234,817

CLASS 315

49 4,234,818
119 4,234,819
152 4,234,820
169.3 4,234,821
209 R 4,234,822
224 4,234,823
371 4,234,824
383 4,234,825
393 4,234,826
408 4,234,827
4,234,828
411 4,234,829

CLASS 318

39 4,234,830
115 4,234,831
146 4,234,832
282 4,234,833
285 4,234,834
317 4,234,835
480 4,234,836
577 4,234,837
696 4,234,838

CLASS 320

36 4,234,839
48 4,234,840

CLASS 323

1 4,234,841
119 4,234,842
4,234,843

CLASS 324

58.5 A 4,234,844
83 D 4,234,845

117 H 4,234,846
146 4,234,847
262 4,234,848

CLASS 328

46 4,234,849
66 4,234,850
145 4,234,851
171 4,234,802

CLASS 329

50 4,234,852

CLASS 330

280 4,234,853
286 4,234,854

CLASS 331

90 4,234,855
94.5 G 4,234,857
94.5 P 4,234,856
177 R 4,234,858

CLASS 333

151 4,234,859
187 4,234,860

CLASS 335

216 4,234,861

CLASS 336

5 4,234,862
90 4,234,863
4,234,864
92 4,234,865

CLASS 337

374 4,233,750

CLASS 339

198 GA 4,234,239

CLASS 340

52 F 4,234,866
146.3 AG 4,234,867
146.3 SY 4,234,868
286 R 4,234,869
348 4,234,870
365 R 4,234,872
365 S 4,234,871
509 4,234,873
539 4,234,874
550 4,234,875
573 4,234,876
629 4,234,877
642 4,234,878
686 4,234,879

CLASS 343

5 FT 4,234,880
8 4,234,881
14 4,234,882
100 CL 4,234,883

CLASS 346

75 4,234,884
140 R 4,234,885
165 4,234,886

CLASS 350

6.1 4,234,240
6.9 4,234,241
218 4,234,242
226 4,234,243
241 4,234,244
269 4,234,245
274 4,234,255
289 4,234,246
320 4,234,247

CLASS 355

3 CH 4,234,249
3 FU 4,234,248
4 4,234,250
74 4,234,251

CLASS 356

73 4,234,252
73.1 4,234,253
244 4,234,254
348 4,234,256
417 4,234,257
437 4,234,258

CLASS 357

24 4,234,887
45 4,234,888
71 4,234,889

CLASS 358

10 4,234,890
104 4,234,891
174 4,234,892
180 4,234,893
250 4,234,894
282 4,234,895

CLASS 360

32 4,234,896
41 4,234,898
45 4,234,897
73 4,234,899

CLASS 361

45 4,234,900
64 4,234,901
120 4,234,902
154 4,234,903
165 4,234,904
307 4,234,905

CLASS 362

16 4,234,906
32 4,234,907
66 4,234,908
100 4,234,909
105 4,234,910
111 4,234,911
145 4,234,912
158 4,234,913
240 4,234,914
252 4,234,915
294 4,234,916

CLASS 363

160 4,234,917

CLASS 364

200 4,234,918
4,234,919
4,234,920
424 4,234,921
426 4,234,922
436 4,234,923
460 4,234,924
494 4,234,925
551 4,234,926
557 4,234,927
571 4,234,928
701 4,234,929
724 4,234,930
900 4,234,931
4,234,932
4,234,933
4,234,934

CLASS 365

15 4,234,935
244 4,234,936

CLASS 366

81 4,234,259

CLASS 367

11 4,234,937
24 4,234,938
87 4,234,939
105 4,234,940
116 4,234,941
128 4,234,942

CLASS 368

35 4,234,943
72 4,234,944
75 4,234,945
76 4,234,946
287 4,234,947
291 4,234,948

CLASS 370

41 4,234,949
71 4,234,950
94 4,234,952

CLASS 371

5 4,234,953
6 4,234,954
51 4,234,955

CLASS 375

38 4,234,956
86 4,234,957
107 4,234,958

CLASS 400

175 4,234,262
219.3 4,234,260
621 4,234,261

CLASS 403

405 4,234,263

CLASS 404

11 4,234,264
16 4,234,265

CLASS 405

26 4,234,266
42 4,234,267
158 4,234,268
195 4,234,269
202 4,234,270

CLASS 406

1 4,234,271
64 4,234,272
90 4,234,273
93 4,234,274

CLASS 408

19 4,234,275
104 4,234,276
226 4,234,277

CLASS 410

69 4,234,278

CLASS 414

33 4,234,279
35 4,234,280
37 4,234,281
45 4,234,282
171 4,234,283
462 4,234,284
4,234,285
512 4,234,286
542 4,234,287
745 4,234,288

CLASS 415

2 R 4,234,289
145 4,234,290
174 4,234,291

CLASS 417

214 4,234,292
365 4,234,293
377 4,234,294
390 4,234,295

CLASS 418

201 4,234,296

CLASS 422

26 4,234,537
64 4,234,538
4,234,539
4,234,540
78 4,234,541
98 4,234,542
109 4,234,543
256 4,234,544

CLASS 423

109 4,234,429
138 4,234,545
139 4,234,546
235 4,234,548
242 4,234,547
245 4,234,549
261 4,234,550
263 4,234,551
268 4,234,552
359 4,234,553
409 4,234,554
484 4,234,555
497 4,234,556
593 4,234,557
4,234,558
629 4,234,559
659 4,234,560

CLASS 424

1 4,234,561
4,234,562
8 4,234,563
12 4,234,564
33 4,234,565
45 4,234,567
47 4,234,566
54 4,234,568
91 4,234,569
177 4,234,570
4,234,571
180 4,234,572
184 4,234,573
4,234,574
204 4,234,575
4,234,645
211 4,234,576
238 4,234,577
246 4,234,578
4,234,579
4,234,580
248.51 4,234,581
249 4,234,582
250 4,234,583
4,234,584
4,234,585
251 4,234,586
4,234,587
4,234,588
256 4,234,589
263 4,234,590
267 4,234,591
270 4,234,592
272 4,234,593
273 P 4,234,594
274 4,234,595
4,234,596
4,234,597
278 4,234,598
279 4,234,599
310 4,234,600
319 4,234,601
330 4,234,602
365 4,234,603

CLASS 425

174.4 4,234,297
186 4,234,298
292 4,234,299
363 4,234,300
392 4,234,301
526 4,234,302

CLASS 426

2 4,234,604
18 4,234,605
24 4,234,606
56 4,234,607
72 4,234,608
104 4,234,609
248 4,234,610
321 4,234,611
394 4,234,612
430 4,234,613
462 4,234,614
478 4,234,615
536 4,234,616
557 4,234,617
607 4,234,618
614 4,234,619
656 4,234,620

CLASS 427

13 4,234,621
45.1 4,234,622
54.1 4,234,623
55 4,234,624
74 4,234,625
97 4,234,626
242 4,234,627
305 4,234,628
388.2 4,234,629
431 4,234,630
436 4,234,631

CLASS 428

2 4,234,632
36 4,234,633
58 4,234,634
80 4,234,635
95 4,234,636
131 4,234,637
133 4,234,638
144 4,234,639
159 4,234,640
4,234,641
188 4,234,642
200 4,234,643
204 4,234,644
215 4,234,646
220 4,234,647
245 4,234,648
255 4,234,649
280 4,234,650
290 4,234,651
296 4,234,652
328 4,234,653
333 4,234,654
374 4,234,655
379 4,234,656
400 4,234,657
403 4,234,658
4,234,659
411 4,234,660
446 4,234,661
500 4,234,662
517 4,234,663
520 4,234,664
541 4,234,665
573 4,234,666

CLASS 429

81 4,234,667
163 4,234,668

CLASS 430

25 4,234,669
52 4,234,670
213 4,234,671
222 4,234,672
252 4,234,673
253 4,234,674
271 4,234,675
286 4,234,676
518 4,234,677
564 4,234,678
619 4,234,679

CLASS 431

293 4,234,303
359 4,234,304

CLASS 432

59 4,234,305

CLASS 433

55 4,234,306
73 4,234,307
127 4,234,308
225 4,234,309
228 4,234,310

CLASS 435

7 4,234,680
8 4,234,681
13 4,234,682
18 4,234,683
75 4,234,684
80 4,234,685
94 4,234,686
99 4,234,687
101 4,234,688
4,234,689
119 4,234,690
191 4,234,691

CLASS 440

101 4,233,925

CLASS 455

35 4,234,959
123 4,234,960
160 4,234,961
173 4,234,962
204 4,234,963
226 4,234,964
285 4,234,965
326 4,234,966
603 4,234,967
607 4,234,968
4,234,969
4,234,970
619 4,234,971

CLASS 474

153 4,233,852

CLASS 493

14 4,234,179
132 4,233,888

CLASS 521

33 4,234,692
107 4,234,693
4,234,694
4,234,695
108 4,234,696
128 4,234,697
188 4,234,698

CLASS 525

55 4,234,699
4,234,700
68 4,234,701
100 4,234,702
211 4,234,703
215 4,234,704
329 4,234,705
390 4,234,706
437 4,234,707
444 4,234,708

CLASS 526

100 4,234,709
125 4,234,710
282 4,234,711

CLASS 528

9 4,234,712
15 4,234,713
67 4,234,714
362 4,234,715
483 4,234,716

CLASS 536

17 R 4,234,717
69 4,234,718
4,234,719

CLASS 542

413 4,234,720

CLASS 544

30 4,234,721
58.4 4,234,722
64 4,234,723
90 4,234,724
140 4,234,725
151 4,234,726
178 4,234,727
198 4,234,728
243 4,234,729
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